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# Ontario Economic Review

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Department of Treasury and Economics

Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister





# Ontario Economic Review

January/February 1971

Volume 9, Number 1

## The Ontario Economy

### Tax Reform and Small Business

Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

### Selected Economic Indicators

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. Charles S. MacNaughton  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.



#### About The Review

The feature article for the January/February edition of the *Ontario Economic Review* advances Ontario's proposals for a new small-business incentive to replace the present dual corporate rate. The plan is based on a limited tax credit to owner-operators as the best means of providing an incentive in the small business area.

The main features of the proposals are:

- a tax credit for individuals of fifty per cent of increased investment in small business;
- the credit will not exceed fifty per cent of personal income tax otherwise payable;
- annual and lifetime dollar limits will be imposed;
- the credit will be restricted to Canadian residents who not only risk their own capital in either an incorporated or an unincorporated business but also pit their own efforts in making the business go;
- tax credits will be recovered when the owner-operator disinvests; and
- rollover provisions will permit asset changes and avoid lock-in effects.

The article was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Policy Planning Division of the Department of Treasury and Economics.

The Ontario economic forecast for 1971 was prepared by the Economic Planning Branch, Policy Planning Division, Department of Treasury and Economics.

#### Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *This applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## cast for 1971

Ontario economy now shows every sign of recovering from the recent recession. Recovery probably commenced in the third and fourth quarters of last year and is now underway. However, a dramatic upturn is not to be expected and it is likely that 1971 will be characterized by a gradual resumption of earlier patterns with the last quarters showing a full six per cent per year real rate of growth. Overall growth for the year is expected to reach 8.5 per cent. Naturally, these forecasts are based on the assumption that the federal government will make good its commitment to take further measures to reduce unemployment now that inflation has at least temporarily subsided.

The recovery will be led by strength in the housing sector. Non-residential construction and purchases of machinery and equipment will be delayed until well into the year, perhaps not recovering fully before the third quarter or early 1972.

Personal consumption expenditure will show considerable improvement over 1970. Part of this revival is due to a shifting of automobile purchases from the last quarter of 1970 to 1971. A more important factor will be the renewed sales of consumer durables which finish the record numbers of new housing units ready for occupancy later in the year.

Exports will continue to expand, but at a slowing rate. It is considered that automobile exports will continue strong as will exports of Ontario's mineral products. However, in the latter case a noticeable softening of demand for metals will be a consideration. Imports will grow more rapidly than in previous years.

At this point, it appears that useful but not spectacular progress will be made against the problems of inflation and unemployment. So far as the former is concerned, the elements of cost inflation are still present and the useful reduction in the price of imported goods due to the appreciation of the Canadian dollar cannot be expected again this year.

Unemployment is likely to remain high for the first half of the year, with minor inroads being achieved later when the economy is operating closer to capacity. The Ontario government is doing its share with programs to create an estimated 3,845 new jobs this winter.

Although there may be some further adjustment of long-term interest rates, the downward trend will slacken unless the economy

Selected Ontario Statistics	1970	1971 Forecast	Per Cent Change	
			1970/69	1971/70
Gross Provincial Product (\$ billions)	34.7	37.6	6.9	8.5
Implicit Price Index	133.0	137.7	3.6	3.5
Corporate Profits (\$ billions)	3.6	3.9	-3.0	10.0
Wages and Salaries (\$ billions)	18.9	20.5	9.0	9.5
Investment (\$ billions)	6.2	6.7	-1.0	9.0
Retail Sales (\$ billions)	10.8	11.5	2.4	6.0
Unemployment Rate (% of labour force)	4.3	4.0	-	-
Productivity	-	-	1.1	1.5

fails to respond to the stimulus of fiscal and other measures.

The threatened steel strike in the U.S. will ensure that the Ontario steel industry is working to capacity. A strike may occur in Ontario's construction industry, as a number of contracts expire in the second quarter. A protracted strike would set back the recovery of Ontario's economy by several months.

## Foreign Trade

The long-expected slowdown in Canadian export sales was recorded in December, however a preliminary total for the year reveals record exports valued at \$16,887 million. In a recent report the Dominion Bureau of Statistics valued total exports in December at \$1,376 million, down by approximately four per cent from the revised total of \$1,431 million for December, 1969. This is the first year-to-year decline in the monthly figures since August 1969 when the total for that month fell marginally below the level for August, 1968.

Adjusted to discount the usual seasonal fluctuations, the December value of \$1,312 million was the lowest of the year, down from a peak of \$1,479 million in November. Since the middle of last year, analysts had been predicting that the upsurge in exports would not last; but sales did hold up, against expectations, until December. Earlier it was anticipated that slow business conditions in the United States — Canada's major trading partner — and the upward valuation of the Canadian dollar which tended to make Canadian goods more expensive abroad would depress foreign sales. However, a strong

demand for metals and fuel shortages in the United States in addition to an apparent buying mood in parts of Europe and Japan sustained a high level of sales.

As a result of the December slowdown, the annual total, on a preliminary basis, fell short of the \$17 billion mark, however at \$16,887 million it represents a 13 per cent increase over the revised 1969 total of \$14,931 million. Previous to December the advance had been running at an annual rate of up to 20 per cent.

A preliminary total places 1970 imports at \$13,934 million, down by somewhat more than one per cent from the level of \$14,130 million recorded in 1969. This represents the first year-to-year decline in imports since 1958. The December total at \$1,041 million (unadjusted), down 16 per cent from the corresponding 1969 figure underlines the extent of the weakness in this sector.

As a result of a record year for exports with imports virtually unchanged Canada's merchandise surplus reached an unprecedented \$2,952 million in 1970. This level greatly exceeds the previous peacetime record of \$1,266 million in 1968 and the wartime high of \$1,700 million in 1945.

The main feature of the 1970 export performance was substantially increased shipments to countries other than the United States. The value of export shipments to the U.S. increased by only 3.5 per cent while exports to Britain advanced by almost 35 per cent. Shipments to the six-nation European Common Market advanced vigorously by more than 40 per cent with Japan's purchases from Canada up by 27 per cent from 1969.



# Tax Reform and Small Business

Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

## FOREWORD

This is the second paper of the Ontario Government containing definite proposals for reform of the Canadian tax system. Since the first paper in June, 1970, the Committees of the House of Commons and Senate on the federal white paper have presented their reports. These reports constitute an important contribution to the current tax reform process.

The Ontario Government was happy to note the emphasis of both reports on the central importance of economic growth in tax reform and that tax reform must not impede savings and investment in Canada. The Ontario Government was also pleased to note the emphasis the Committees placed on achieving a national tax system which could be used by the provinces.

There were two main thrusts to the first *Ontario Proposals*. The first was effective comprehensive relief for low-income Canadians. The second was economic growth.

This article deals only with the second of these thrusts — with its main emphasis on the appropriate taxation of small business in a tax context favourable to Canadian savings and investment. The paper proposes a new incentive to assist a very broad group of Canadians — those who risk their money and employ their energies to start and expand their own businesses — Canadian owner-operators. The Ontario Government believes that the incentive proposed would provide strong encouragement to expanded Canadian participation in the Canadian and world economy. It would do so by helping Canadians raise needed capital. It would not discriminate against foreign investment which will continue to play an important role in Canadian development.

The Ontario Government has advanced its studies on the taxation of small business to the point where it feels the results would now benefit from wider discussion. Accordingly, we invite comment and public discussion by interested taxpayers. We also invite the federal government to sit down with provincial governments and to discuss these and other reform proposals on a frank and open basis where all views are on the table. This is the only way to achieve a partnership approach in the final stages of settling the long-term tax structure for Canada and the provinces. The frankness of discussions between the provincial and federal governments must not be circumscribed by traditionally secret budget procedures which are unsuit-

able where major long-term changes are being made.

The Honourable Charles MacNaughton  
*Treasurer of Ontario  
and Minister of Economics*  
December, 1970

## I INTRODUCTION

Tax reform discussions have advanced considerably since the Ontario Government set out its general proposals for national tax reform in its paper *Ontario Proposals for Tax Reform in Canada*.<sup>1</sup> These developments confirm the thrust of the *Ontario Proposals* in their emphasis on economic growth as a central concern of tax reform.<sup>2</sup> The primary purpose of this paper is to expand upon the proposals for the taxation of small business contained in Chapter 6 of that paper. In addition, this paper will expand upon the related proposals affecting savings and investment in Canada. The proposals contained in this paper are properly to be considered as a further development of the basic national tax system contained in the *Ontario Proposals*.

### Small Business Consensus

The *Ontario Proposals* reflected the profound concern of the Ontario Government about the possible effects of the federal white paper proposals on small business in Canada.<sup>3</sup> This widely-shared concern was expressed in the submissions of many taxpayers and other provincial governments, and resulted in the announcement by the federal Minister of Finance of the appointment of a federal civil service committee to study and recommend appropriate measures designed to strengthen the role of small business in Canadian life. It was further reflected in the subsequent reports on the federal proposals by the Senate and Commons Committees.<sup>4,5</sup>

There is clearly a broad consensus in Canada that small businesses require taxing arrangements favourable to their development and growth. There is virtual unanimity that the federal proposal to abolish the lower rate of corporate tax on the first \$35,000 of taxable income without offering any effective alternative is too harsh and that it would be damaging to small business, both by itself and in conjunction with other proposals in the federal white paper. The question is thus not *whether* the original federal proposals should be changed but only *what* should be done and *how*.<sup>6</sup>

### Broad Benefits of Small Business

The reasons *why* something should be done are important in deciding *what* should be done. For example, if the only aim is to correct an alleged lack of "neutrality" in the marketplace in the raising of capital for small business, any special small business provision should be designed with this in mind. On the other hand, if the objective is the more political one of encouraging certain type of activity, a rather different approach will be more appropriate.

Tax incentives are not the only means of assisting small businesses. A very extensive range of incentives is already provided both the federal and provincial governments outside the tax system. These include many supports, grants, loans, guarantees and a variety of business-related services. Many of these incentives help small businesses but are not restricted to them. Rather, they are designed to achieve selective objectives which are related to a particular industry as with grants payable under the federal Development Industry Productivity Program, or to regional development as under the Ontario Equalization of Industrial Opportunity Program.

The position of the Ontario Government is that broad social and economic benefits can be derived from the effective encouragement of

<sup>1</sup>Hon. Charles MacNaughton, *Ontario Proposals for Tax Reform in Canada*, (Toronto: Department of Treasury and Economics, June, 1970); hereinafter cited as the *Ontario Proposals*.

<sup>2</sup>The *Ontario Proposals* made it clear that tax reform was not the only other major concern was comprehensive tax relief for low-income Canadians.

<sup>3</sup>Hon. E. J. Benson, *Proposals for Tax Reform* (Ottawa: Queen's Printer, 1969); hereinafter cited as the *federal white paper*.

<sup>4</sup>The *Standing Senate Committee on Banking, Trade & Commerce*, Report on the White Paper on Tax Reform, (Ottawa: Queen's Printer, September, 1970); hereinafter cited as the *Senate Report*.

<sup>5</sup>Eighteenth Report of the Standing Committee on Finance, Trade & Economic Affairs respecting the White Paper on Tax Reform, (Ottawa: Queen's Printer, October, 1970); hereinafter cited as the *Commons Report*.

<sup>6</sup>In the light of this consensus, it is interesting to note the comments of the Carter Report respecting withdrawal of the lower corporate rate: "[We] believe it would be unwise to recommend withdrawal of the low corporate rate without making some adjustment with the tax system designed specifically to assist medium and small businesses." Report of the Royal Commission on Taxation, (Ottawa: Queen's Printer, 1966). Volume 4, page 277.



nesses through the tax system. Many of the reasons are described in the *Ontario Proposals*.<sup>7</sup> Accordingly, this paper will consider the best means of utilizing the tax system for fostering a climate or environment of opportunity to which individual Canadians can respond with their own initiative and enterprise.

### Dual Rate until Replaced by Incentive

The position of the Ontario Government is to retain the present dual rate of corporate tax on small business until a new strong incentive can be found to replace it.<sup>8</sup> This is in some respects similar to the position of the Commons report which suggests, as a minimum, an approach which is to involve something like a dual rate. However, that report also suggests that alternative proposals (such as a capital formation tax credit) which might prove more effective in the longer run should be studied.<sup>9</sup> The Senate report recommends retention of the lower rate and offers a method of restricting it to smaller businesses.<sup>10</sup>

This paper will assess the validity of retaining the dual corporate rate on some more appropriate basis. It will also explore the possibility of an effective alternative which can achieve more benefits for the economy at a reasonable cost in revenue. One reason the Ontario Government favours a strong incentive to Canadians to acquire, develop and expand new and small businesses is because lasting revenue increases can only flow from an efficient and dynamic economy created by individuals who respond to an environment of incentive and opportunity.

### Taxation and Small Business Dynamics

In the federal white paper proposal to eliminate the dual corporate rate generated the greatest amount of concern in public discussion, there are several other important structural features of the tax system which can affect both the incentive and ability of Canadians to start a new business or acquire and expand an existing business. All must be taken into account.

Taxation must be viewed in a dynamic context and must recognize the motivations and financial capacities of those affected. The fact that income taxes are normally collected on the basis of a single year does not mean that tax policies should be similarly circumvented. Successful businesses can take a long time to build. Taxation must recognize this if the building-up process is not to be seriously

impeded. It is too restricted a view of the ability-to-pay to regard funds surplus to the needs for productive investment and funds tied up in productive investment as always equally available to pay taxes. This is an essential point in designing taxes which will permit and encourage the growth of the small business sector of the economy.

People's motives in starting or running their own business vary, but they usually include two elements: the greater personal fulfilment in creating or running one's own business; and the hope of building up something permanent — which may provide retirement income, or capital for some other purpose or to leave to one's heirs. Such motivations are not primarily directed at earning slightly more in current income in a particular year. Generally, it is the ability to retain earnings for expansion and to hold on to a reasonable part of what one has built up which is important to the small businessman. Taxation which affects either of these factors can have important effects on the commencement, development and expansion of small business. What is required is greater awareness of the concrete effects of different taxation arrangements on small business in a dynamic sense over the life of the business and the businessman.

### Primary Importance of Effects on Savings and Investment

The Ontario Government approach is that the general savings and investment effects of taxation are of primary importance, to be dealt with in the first instance on a very broad basis related to national goals. These goals include the efficient growth of the economy, the provision of jobs, the control of inflation and the encouragement of Canadian savings.<sup>11</sup> Any tax encouragement of small business should fit sensibly and easily into the general taxation arrangements. But specific tax arrangements cannot make up for inadequate or unwise general arrangements.

The savings and investment approach outlined in the *Ontario Proposals* involved two main elements:

- general taxing provisions favourable to savings and investment which would be applicable to all business; and
- additional special savings and investment promoting taxing arrangements which would be available *only* to individual Canadian residents.<sup>12</sup>

These special arrangements for individual Canadians were also proposed as a means of promoting two other important national objectives:

- increased Canadian ownership in profitable business; and
- broadened economic democracy by making it easier than it is today for more people to save and invest in Canadian enterprise, and so to participate more fully in the economic opportunities of Canada.

### Principles of Ontario Approach to Savings and Investment

The investment and savings approach of the Ontario Government reflects two main principles:

- *Current income differs from capital as a source of future income.* Many unnecessary and undesirable problems flow from a failure to recognize this difference in taxation. Current taxation of income and consumption is appropriate because most taxpayers can adapt to reasonable changes on a current basis — by working more, seeking higher incomes or reducing expenditures. On the other hand, a lifetime basis for taxing capital is generally preferable so long as it remains such and is not diverted into the current consumption stream. Capital investment usually represents the results of the efforts of many years or decades, and is frequently committed for many years into the future. This greatly reduces the degree of taxpayer adaptability in the short run. To the extent that such a lifetime basis of taxing capital is adopted — be it by capital gains or estate taxation — it will lend strong support to particular measures to promote small business, as well as bigger business, in the hands of Canadians.
- *The primary taxation arrangements should provide a framework of opportunity that leaves individuals free to respond in a very broad way as they see fit.* This does not preclude more selective measures inside or outside the tax system, for the achievement of more particular ends. However, it precludes as the primary arrangement the use of taxation, subsidies or loans in a very specific way, since this could introduce a much higher degree of government intervention and direction of activity than is sound for widely applicable measures.

beginning of Chapter 6 of the *Ontario Proposals*. Similar reasons were given for the continuing importance of small businesses in the United States. See, *The President's Task Force, Improving the Prospects of Small Business*,

(Washington: U.S. Government Printing Office, 1970).

<sup>8</sup>Ontario Proposals, op. cit., page 33.

<sup>9</sup>Commons Report, op. cit., pages 52 and 53.

<sup>10</sup>Senate Report, op. cit., page 65.

<sup>11</sup>Commons Report, op. cit., pages 8 and 9.

<sup>12</sup>Ontario Proposals, op. cit., pages 21, 25 and 33.



### **Approach of this Paper**

Our studies make it clear that there are a variety of small business and related investment options open to policy makers, each with advantages and disadvantages. There are no proposals without disadvantages. Disadvantages, however, must be assessed against the probable gains. Thus, an awareness of the alternatives available is necessary to place any particular proposal in proper perspective. There are no ideal solutions, and a preoccupation with ideal solutions will likely prevent adoption of practical ones.<sup>13</sup>

This lively awareness of alternatives underlies the approach in this paper. Within this approach, the first step is to establish the tax context in which small business is expected to operate. The second step is to identify the key concepts which should guide the particular small business tax arrangements adopted. Only then is it possible to explore the best mechanics or taxation devices to give effect to the guiding concepts which have been accepted. This presupposes identifying what we are trying to achieve in a practical way, before proposing the taxation mechanics to achieve it.

### **New Small Business Tax Incentive**

After careful study of the alternatives, and the benefits to Canada of a new strong incentive to new and small business, this paper will propose for serious consideration a fresh approach based on abolition of the dual corporate rate. It has a number of novel features:

- only individual Canadian owner-operators would qualify for the incentive;
- the maximum annual amount of the incentive available to an owner-operator would be comparable to the maximum annual benefit now available through the lower corporate rate, but would be dependent upon new or increased investment in unincorporated or incorporated business;
- the incentive would be ultimately recoverable in a manner which should not interfere with sound business decisions or the effectiveness or fairness of the incentive; and
- annual and lifetime limits on the total amount of incentive available to any one person should ensure fairness and administrative workability.

The choice of the Canadian owner-operator as the person to get the incentive means that not every business or investor would benefit. But far more Canadians would benefit than under the present lower corporate

rate. Every small business, whether or not incorporated, could benefit. It would help Canadians to start or acquire a business more easily than the present system. It would enable them to join together in business without loss of tax benefits as at present. Passive investors, large corporations and non-residents would no longer benefit. The only Canadian owner-operators today who would benefit less are those whose initial or expanded investment is insufficient to take full advantage of the incentive. Finally, after introduction of the new system, every Canadian who invests as an owner-operator would be entitled to earn precisely the same lifetime credit as every other Canadian.

### **Incentive Strong but Not Unlimited**

The incentive would be strong but it would not be unlimited. Being a Canadian owner-operator would not be enough. Investment in the business would also be required. Similarly, investment in the business would not be enough — one must also be a Canadian owner-operator. Not only would there be a limit to the total amount of incentive available to any Canadian, but once in every lifetime the amount received would be fully or partially recovered to the extent the business is successful. And quite apart from recovery, every recipient would have to pay at least as much in annual taxes as he receives in annual tax deferrals. In a real sense, the success of those helped by the incentive would in turn provide revenues to help new Canadian owner-operators to succeed for their own benefit and the benefit of Canada.

The proposed small business incentive is expected to work relatively simply in the vast majority of cases. However, the variety of business arrangements and the predilection of some taxpayers to seek undue advantage of any favourable taxation arrangements mean that a measure of complexity is necessary for the special cases. It is anticipated that the main increase in complexity from tax reform — assuming integration does not replace the present dividend tax credit system — would come from the introduction of capital gains taxation. The administrative features of the proposed incentive should fit reasonably easily into the administrative requirements of capital gains taxation.

### **Full Consideration Important**

The owner-operator incentive is proposed because it is felt it is workable and would encourage significant response from Cana-

dians. While it is only a proposal, the Ontario Government believes it merits serious consideration in terms of its potential for promoting simultaneously a number of important goals. As a novel proposal, there may be insufficient time to assess it in a deliberate and careful manner and have it ready for implementation by the tax reform target date of January 1, 1972. If this turns out to be the case, the dual corporate rate should be maintained for one further year.

The novel aspects of the proposal and the fact that there is no experience from which to judge taxpayer response and revenue impact must be accurately determined in advance of a full discussion even more important than is usual. A number of the specific features, such as the businesses to be included and excluded, the proposed annual and lifetime dollar limits and the manner and extent of ultimate recovery, are advanced as reasonable starting points for discussion and are certainly open to modification. Further, if the plan were implemented it would be desirable after a few years of operation to review the nature of the response to determine whether effectively the incentive is working in relation to the objectives sought.

The proposal is advanced as a long-term encouragement to the development of the Canadian economy by Canadians, and must be considered in this light. At the same time it has the important merit of not discriminating against foreign investment. Canada must continue to need foreign investment in the foreseeable future if widely accepted objectives are to be achieved.

A detailed technical study of the proposal advanced in this article has been prepared by the Taxation and Fiscal Policy Branch of the Department of Treasury and Economics. This study contains particulars of the operation of the proposed small business incentive under a variety of circumstances, with arithmetical examples. It also contains arithmetical comparisons between alternative tax systems. This study should assist in the consideration of the desirability and workability of the proposed small business incentive.

## **II THE PRESENT SYSTEM AND FEDERAL WHITE PAPER PROPOSALS**

The Ontario Government approach should attract attention to all tax burdens in order to judge their appropriateness in relation to tax policy objectives. It also emphasizes the importance of

<sup>13</sup>The Commons Committee arrived at a similar conclusion. Commons Report, op. cit., page 8.



economic growth. Now is not an appropriate time to introduce new tax burdens which will make economic growth more difficult to achieve. This chapter compares the present Canadian tax system, the present United States tax system and the federal white paper system in order to appraise how Canadian small business may be best encouraged to develop and grow under a reformed Canadian tax system. This comparison provides an essential basis for assessing the system proposed by the Ontario Government for small business taxation.

### Present Canadian System

In general, the present system (ignoring the estate and gift tax changes)<sup>14</sup> constitutes a strong incentive to create and expand businesses and to retain earnings for investment rather than distribute them. While the taxes (but not gift taxes) have been undeniably heavy, estate planning has often been able to reduce their burden or spread the period of their impact. Further, the absence of a capital gains tax and the generally lower rates of corporate tax in comparison with high marginal personal tax rates have generally encouraged retention of earnings in business while it was being built up.

A Canadian starting a business under the present system is in roughly the following position. There is no individual tax concession in respect of any initial business investment. If an individual's business is incorporated, the first \$35,000 of annual taxable income after salaries and bonuses can be retained in the business at about \$10,000 annual saving of corporate tax by virtue of the lower corporate rate being applicable to that level of income. This saving can be lost, however, and the high corporate rate applied to retained earnings in some circumstances — if the corporation has other shareholders who are also shareholders of other companies, or if the individual is a shareholder in another company, and the technicalities of the shareholder relationships are such as to give rise to the company being associated with one of the other companies.<sup>15</sup>

High personal tax rates encourage retention of earnings above \$35,000 in many cases, because the corporate rate is less than the personal rate. Most important, however, capital gains are tax-free, so that going public<sup>16</sup> or selling out does not result in any loss. Difficulties arise in estate planning in connection with corporate surplus and estate taxation — the potential combined impact of

two taxes at death. While estate planning can frequently modify the impact, it is generally agreed that any tax reform should face this issue head on. Whatever is proposed should deal with the question at death, and not attempt palliative measures like deferring the tax impact past the death of the owner.<sup>17</sup>

The principal advantages of the present system are thus encouragement of retention of earnings for growth and the tax-free treatment of any gains in the capital value of the business. Going public, for example, as a natural stage in the history of an expanding business, creates no tax problems and may even alleviate some. These are strong incentives, and their merit as such was only partially negated by the problems associated with the taxation of corporate surplus and estates.

The lower rate of corporate tax has certain disadvantages, even from the standpoint of small business:

- the restrictions of associated company status;
- the need in most cases that there be profits from the new business itself;
- it does not extend to unincorporated business; and
- it does not begin to provide any significant tax relief until personal incomes exceed about \$10,000 and becomes proportionately more valuable as individual incomes increase.

Nonetheless, the present balance — the dual corporate rate, high graduated personal tax rates and the taxation of corporate income in the hands of corporations and of dividend income in the hands of shareholders — is a stable one which fosters retained earnings in businesses. Any instability in the present system which surrounds the corporate surplus problem arises principally from two elements which could be readily corrected:

- the absence of sensible tax-free corporate reorganization provisions combined with the "sledgehammer effect" of the designated surplus provisions;<sup>18</sup> and,
- the failure to deal directly with the appropriate relationship between the possible taxation of corporate surplus at death and the level of estate taxation.

### United States System

The United States tax system provides similar incentives toward retained earnings by small

business. While the maximum annual per-company savings are less than in Canada at present, at about \$6,500, it is generally easier to qualify a *new* or *different* business in order to get the same benefit more than once. The capital gains aspect is less favourable, at least in principle, while the weight of estate and gift tax is generally comparable. However, United States capital gains tax may be avoided completely by tax-free rollovers<sup>19</sup> to a higher cost basis in the hands of heirs on death, or to the same cost basis by an exchange of shares of the small business corporation for shares of an acquiring company. A combination of both rollovers may be used: first, by selling out in exchange for the stock of a public company, and then by holding that stock to death, at which time it can be sold free of capital gains taxation on the increased value accrued to the date of death. In practice, therefore, despite the existence of a capital gains tax, and a lower rate of tax on only the first \$25,000 of a corporation's income, the present position of the small businessman in the United States is not significantly less favourable than in Canada.

### White Paper System

When it comes to the federal white paper system, including the estate and gift tax changes of 1968, small business is transported into a radically different and harsher world. Gone are the factors which encourage retained earnings. Not only is the favourable treatment of capital gains gone, but there is also the harsher ultimate taxation of capital on the deaths of parents and the much restricted opportunities to ameliorate that impact through estate planning. Both building up and retaining the business become much more difficult. Only wealthy owners of businesses which are not worth more than their book value and do not need retained earnings to grow would benefit from full corporate-personal income tax integration and a top 50 per cent personal income tax rate. They could avoid any capital gains tax and would pay substantially lower annual taxes than at present on fully distributed earnings. By contrast, the sale of a company while closely-held which is valued for its growth potential rather than retained earnings would result in capital gains taxation at 50 per cent, or at 25 per cent as part of going public. In the latter case, there would also be the continuing five-year revaluation rule requiring payment of capital gains tax on any shares retained

*A fair assessment of the impact of tax reform on small business requires a comparison of the Canadian tax system before any reform and the complete reformed system. Accordingly, we refer to "present Canadian system" as the system in effect before the estate and gift tax*

*changes. We refer to the white paper system as including these estate and gift tax changes as part of the federal proposals for tax reform.*

<sup>15</sup>This is the associated corporation problem referred to in the white paper (paragraphs 4.16 and 4.17). While the federal white paper stresses

*the undoubted abuse of the lower rate by some taxpayers who until 1963 avoided the rules designed to limit the advantage, it does not refer to the restrictive effect of these same rules on normal business arrangements.*

<sup>16</sup>"Going public" is the process whereby a



after going public. This is in addition to substantially heavier estate taxation and elimination of the lower corporate rate.

The combined impact of the federal tax reform program represents a much harsher treatment of smaller business than either the present Canadian system or the United States system. The situations where the federal proposals are significantly harsher include starting a business and then selling it at a capital gain; or going public with it; or dying with an accrued capital gain from the business which must then be realized, either to pay the estate taxes or for some other reason such as a partnership buy-sell arrangement or the need for new management or more capital.

### Present Balance Hurt by Federal Proposals

On balance, the present Canadian tax system has probably been more favourable to the creation and expansion of new small business than that in the United States. Of course, the business earnings and capital gains prospects in the United States tend to be greater than in Canada because of the larger markets and higher levels of income and wealth in the United States. At the same time, the effect of the present Canadian tax system has not been so favourable as to promote private savings in Canadian hands in sufficient volume to eliminate the need for foreign investment or to enable Canadians to compete successfully with non-residents in all cases for ownership of Canadian business. It is hard to see how shifting the Canadian tax balance in a manner adverse to private savings by Canadians can avoid worsening the present international balance of ownership and control.

In contrast to both the present Canadian and United States tax systems, the essence of the federal white paper approach is to trade significantly lower taxation of current income distributed to shareholders for harsher annual income taxation of retained earnings (up to the first \$35,000 of annual corporate income) and higher taxation of built-up or accumulated capital of the small business.

The Ontario Government rejects this thrust as inappropriate, not only for small business, but for the whole Canadian economy as well. This rejection was virtually unanimous in every respect in the private submissions to the Commons and Senate Committees and provincial statements on the federal white paper. Finally this rejection was fully supported by the reports of both the Commons and Senate Committees.

*corporation previously owned by one shareholder or a small number of shareholders becomes owned by many shareholders (the public) who do not form a particular group.*

<sup>17</sup>This unsatisfactory approach was adopted in the federal white paper by providing a rollover

## III ONTARIO'S SMALL BUSINESS INCENTIVE

The Ontario tax reform emphasis is one of encouragement of capital investment and retained business earnings for reinvestment. The designing of an effective small business incentive is approached in this context, having regard to the motivations and financial abilities of those affected. Moreover, as there are broad reasons for special small business tax arrangements, the approach must be suitably broad if the desired effects are to be achieved.

The characteristics of a new small business incentive must promote the objective of an environment of economic opportunity for more and more Canadians. At the same time, it is important that the incentive be understandable, capable of reasonable and even-handed administration, responsible in terms of revenue impact, and fair in its availability and in relation to the treatment of other taxpayers who also respond to the needs of the economy. In principle, every Canadian who wants to get into his own business, whether alone or with other Canadians, and who requires capital to do so, should be helped.

### Six Basic Questions

There are six basic questions, the answers to which will determine the form and amount of any incentive based on these principles:

- who or what should qualify?
- what is the basis of getting the incentive?
- should the incentive apply at the individual or corporate levels, or both?
- what limits should be imposed?
- should there be total or partial recovery of the incentive in specified events?
- should there be one incentive or more than one?

A consideration of the six basic questions has led the Ontario Government to advance as its preferred approach, a specific small business incentive based on two fundamentals:

- the only taxpayers to benefit will be individual Canadian resident owner-operators of businesses; and,
- the tax benefit will be directly related to increased investment in businesses.

A number of other features are proposed, but it is the above two features which the Ontario Government regards as basic to an

*at death, but without eliminating potential gains tax subsequent to death by increasing the cost basis to heirs to the fair value on which estate tax is paid as is done in the United States.*

<sup>18</sup>Corporate reorganization is a general term that refers to a variety of different legal means

effective small business incentive to repurchase the lower rate on the first \$35,000 of income of a corporation.

### Main Incentive Features

The following are the main features of the proposed incentive:

- *available only to individual Canadian owner-operators; not to non-residents, passive investors or corporations.* An owner-operator is that individual who contributes his own capital and efforts to run his business, alone or with others.
- *both incorporated and unincorporated business would benefit.* This would be achieved by making the incentive available to the individual only. There would be a reduction in the tax payable by the corporation.
- *incentive would be related to increased business investment.*
- *incentive would be the equivalent of an individual tax credit equal to 50 per cent of increased business investment.*
- *tax reduction in any one year would be limited to 50 per cent of the personal taxes otherwise payable.* In this way annual individual taxes paid would be at least equal to annual tax savings achieved.
- *increased business investment which resulted in a higher tax credit than could be taken in the year of investment could be carried back one year and forward one year, if desired.*
- *use of the tax credit approach would provide substantially the same proportionate benefit for high and low-income earners.*
- *annual and lifetime limits on the value of the incentive, say \$10,000 a year and \$100,000 a lifetime.*
- *property investments, portfolio securities, and mining and oil and gas investments would not qualify.*
- *incentive would be recovered fully or partially on death or permanent emigration and on disposition or withdrawal of investment.*
- *reasonable rollover provisions relating to reinvestment to avoid lock-in effects arising because of the recovery principle.*

It is believed that the above features, taken together, provide a balanced and workable system. The individual owner-operator business investment tests would require

*whereby businesses under common ownership are rearranged by consolidation under a common corporate roof or by separation into separate corporate roofs. The essence is that there be no change of ultimate ownership as a result of the reorganization, although the*



things happen in the economy, before any incentive benefit could be claimed. These are the real things intended to be encouraged, and only if they were done could there be any incentive benefit. There could be no advantage or disadvantage between incorporating or not incorporating, or between differing corporate structures or shareholdings. The provisions of annual and time limits and ultimate recovery would further reduce the likelihood of attempts to manipulate for the tax advantage. They would not reduce any benefit of doing so.

An incentive given to individual Canadian resident owner-operators cannot be said to be discriminatory in international savings or investment. It would facilitate the raising of capital by Canadian owner-operators but would impose no restrictions on where it was used. Indeed, because of the importance of increasing Canadian-based and owned business involvement in the world economy, Canadian resident owner-operator activity outside Canada would qualify. In many cases, especially in the expanding service business, outside Canada may be the most appropriate place for expansion.

The position of this paper is that it is a certain type of businessman — the Canadian owner-operator — who should get the incentive. The person to be encouraged is the person who risks his own capital and credit and puts his own efforts to make a business grow. With very few exceptions indeed, a business may be regarded as a small business if it is, by and large, financed and operated by the same people. A small business is thus best described as a business which is a person's own business, either alone or along with other people.

If this approach were adopted, passive investors in a small business would not themselves benefit, as they can now. They would be treated like all other investors. Equally, a small business in which the investors were a group, and the professional managers another group, would fail to qualify. It follows that going public would not be impeded so long as the outside share interest did not become so great as to result in Canadian owner-operators losing control.

#### Wide Flexibility for Owner-Operators

This basic balance of the proposed incentive, in terms of administrative and revenue considerations, should permit the other features of the incentive to be flexible. In this way, individual Canadian owner-operators could

respond in the manner most suitable to them from a business point of view. As proposed, there could be wide flexibility for Canadian owner-operators:

- almost unlimited freedom to join together with other Canadian owner-operators without tax penalty;
- significant, although not unlimited, freedom to permit non-owner-operators to contribute capital to the business without tax penalty;
- unlimited freedom to grow without tax penalty;
- ability to apply tax reduction privilege against income from other sources, including employment income;
- funds to acquire existing business and every kind of tangible and intangible assets can qualify;
- investments could be timed on a business basis; and
- freedom to incorporate, join a partnership, or operate as a proprietorship, with no tax penalty.

The proposed incentive would in some respects be less broad than the present system:

- it would not apply to all corporations or types of business;
- it would be recoverable, if the owner-operator were successful, although only on disposition or withdrawal, or permanent emigration or death;
- an individual could not get multiple tax benefits through use of more than one corporation;
- large companies, passive investors and non-residents would get no benefits; and
- earnings would not be enough, there must also be business investment.

However, none of these limiting features should reduce the effectiveness of the encouragement to Canadian owner-operators to acquire and expand their businesses. Rather, they should reduce revenue losses and increase fairness by ensuring that the incentive goes to those Canadians who are intended to respond to it.

#### Entrepreneurial Capital

It is generally recognized that entrepreneurial ability is scarce, not only in Canada, but everywhere. The Watkins Report found that

Canada was not rich in entrepreneurial and managerial talent (the owner-operator sort of person) and that there has been in Canada a less open and mobile society than is consistent with optimal development of Canadian entrepreneurship. Its report also suggested that if there is any gap in the Canadian financial system, it is "entrepreneurial capital" — capital allied with human skills actively used in developing and managing the enterprise in which it is invested.<sup>21</sup>

Should the broad approach to encouraging owner-operators be extended to those who provide entrepreneurial capital but do not meet the owner-operator test? Is there a category other than the owner-operator and the passive investor which deserves attention as part of a small business incentive? This type of capital is related to launching new things — and if new things in general, or in particular, are also to be encouraged, it would seem preferable to approach this on a separate basis, because the principles and purposes will be different. Of course, the general structure of the tax system will be particularly important for entrepreneurial capital mobility. As entrepreneurial capital is scarce, it seems important that it not get frozen into investments that cease to be entrepreneurial, simply because the tax cost of switching is too high. This question is separate from, although not unrelated to, the issue of incentives to small businesses.

#### Size or Newness Test

A size or newness test would narrow the scope of the incentive by excluding those owner-operators whose businesses grew too much or were no longer new. As growth is desired, it is important not to penalize those who succeed in growing. Moreover, it is important to encourage owner-operators to maintain and expand existing businesses as well as to create new businesses.

A newness test would be difficult to apply. It would also favour businesses which changed by revolution or came out of nowhere — a single identifiable step immediately recognized as new — in contrast to those businesses which were in a state of constant change by evolution, where one could never say at any one moment that a new business had been created.

One important practical disadvantage of a size test is that, if it is based on income, it either involves very high marginal rates of tax as the business grows into the cut-off area or else the cut-off is smoothed over such an

organization itself may precede or follow such a change.

A rollover arises where one asset is substituted for another in a transaction in which any gain or loss is not recognized for tax purposes.

<sup>20</sup>Lock-in arises where a taxpayer prefers to continue to hold an asset rather than pay tax on disposal.

<sup>21</sup>Report of the Task Force, Foreign Ownership and the Structure of Canadian Industry, (Ottawa: Queen's Printer, 1968).



income range that all but the largest corporations would continue to benefit from the lower rate.

The Commons Committee proposal of a disappearing incentive would impose a tax of 66.3 per cent on the first \$70,000 of income above \$35,000, while the Senate Committee proposals would entail a tax rate of 100 per cent on the first \$21,150 of income above \$100,000. These high rates would penalize success and encourage tax manipulation to keep income down in order to avoid them.

Another disadvantage of the size of business test is that it runs counter to desirable mergers designed to increase efficiency through increased scale of operations.<sup>22</sup> This is unfortunate, as smaller scale in Canada is frequently cited as an important factor in the lower productivity of some Canadian industry in relation to United States industry. In the absence of other tests, choosing a size-of-business test will result in part of the benefit going to passive investors, large corporations or non-residents who were shareholders in a corporation receiving the lower rate or other incentive.

### Basis of Getting Incentive

The position of the *Ontario Proposals* is that the incentive should promote economic growth and efficiency by Canadians through limited tax credits or deferments related to increased business investment in qualified assets. Thus, if there is no such increased investment, there would be no tax relief from the incentive, even though the Canadian owner-operator qualified as such.

An incentive related only to business earnings does nothing for the business which one might argue needs it most—the business suffering losses or not yet profitable. While it has the merit of being success-related, it may jeopardize success, by not becoming available early enough in the life of a business. An investment-related approach at the individual level opens up two possibilities. First, if there is other personal income, the increased investment can qualify for a tax reduction on that other income even before the business earns income. Second, even where there is insufficient other personal income, a carry-forward provision ensures getting tax deductions as soon as income does develop.

A lower tax rate on small business income which is unrelated to investment is unquestionably a meaningful incentive. However, an open-ended forever incentive will almost certainly lead to a need for more stringent

and complicated controls, such as the present associated corporation provisions and a size test. Yet these provisions penalize sound mergers and partnerships. Any requirement that the business stay small is contrary to the growth encouragement intended. Moreover, an incentive which only goes to Canadian owner-operators in respect of business investment is likely to achieve more by way of desired results in relation to revenue loss.

Since the incentive would be related to investment in real business assets, what assets should qualify? In the first place, mining and oil and gas investments (that is, investments qualifying for fast write-off or depletion) would be excluded as already covered by special industry rules. In the case of a property investment company, the appropriate level of capital cost allowance is the proper question to be decided. If something more is needed, an investment credit is a more appropriate approach. Again, portfolio-type investments in bonds, mortgages and shares would not qualify, as being appropriately the subject of general rules relating to the taxation of income and gains from such investments. Further consideration may disclose other types of activity which should also be excluded. Apart from these exclusions, *bona fide* investment in every other kind of business asset should be permitted as most consistent with the purposes of the incentive. The source of investment funds should be largely immaterial, and borrowed money or personal guarantees in respect of borrowed money should normally qualify.

### Individual or Corporate Level

The great merit of the lower rate of tax at the corporate level is that, at least in principle, it is relatively simple to administer and understand. The associated corporation problem has been the principal source of administrative difficulties. There are, nonetheless, a number of disadvantages of a corporate level incentive, some of which have already been alluded to:

- without size criteria, large corporations benefit and without an ownership test, non-residents benefit;
- with size criteria, growth is penalized and manipulation encouraged;
- it can be relatively inflexible, with natural business arrangements penalized on the one hand while unnatural business arrangements are encouraged on the other;

- the incentive cannot be used to reduce on other personal income during period of little business income or business losses;
- distinguishing between corporations has been universally rejected in the case of federal proposal for a closely-held vs. widely-held distinction. Similar problems will inevitably arise in attempts to distinguish between corporations for the purpose of qualifying for the lower rate; and
- it does not apply equally to the incorporated and unincorporated business, benefits high-income taxpayers proportionately more than low-income taxpayers.

The point about individual owner-operated business investment is that it is real. Corporations are essentially artificial and can be manipulated and multiplied in a fashion not necessarily related to real business activity. This is not possible with individuals and is difficult to achieve with investment in business assets. Moreover, a size test based on income is more easily met artificially than a test related to investment. It is easier to keep corporate income down than to get business investment up, in addition to being the opposite of what is desired.

### Amounts and Limits of Incentive

The approximate value of the present rate of tax to a one-man business corporation earning at least \$35,000 a year and reinvesting those earnings in growth is \$10,000 a year. Accordingly, it is proposed that the maximum incentive per year for any individual owner-operator could be the same but in the revised form of a tax credit equal to one-half of increased qualified investment. By using a tax credit, the proportion of tax benefit available to individuals will be unaffected by the level of their other personal income. The timing of tax credit reductions would be affected by the requirement that there be a maximum credit in any one year of 50 per cent of the personal income otherwise payable in that year.<sup>23</sup> Moreover, every owner-operator would face the same lifetime limit on the maximum dollar value of the incentive.

If one-half of the amount of increased qualified investment exceeded the amount of tax credit which could be taken in a particular year, the unused portion of the increased investment could be carried back one year and carried forward indefinitely. It could be utilized for tax credits as quickly as possible within the limit of not more than a 50 per

<sup>22</sup>If four owner-operators each had a business of the maximum qualifying size, then however sensible it might be for them to join together, the tax cost would be \$30,000 a year under the

present system and \$40,000 a year under the Senate or Commons Committee proposals. This would constitute a heavy penalty for joining together.

<sup>23</sup>Only personal income tax would qualify for reduction. Capital gains under the *Ontario Proposals* are to be taxed under a separate system without reference to personal income taxation.



reduction in tax in any one year. In this way, timing of investments could be made in response to business and not tax considerations.

Under the Senate and Commons proposals, as well as the present system, a one-man company earning exactly \$35,000 in business some a year could do so forever, without a dollar increase in investment, and still save \$20,000 annual corporate tax. It seems likely that this open-ended low rate is unnecessarily costly in relation to the objectives set. If there were a \$100,000 lifetime limit — a difficult concept with a corporation, which would presumably require a new business test of one kind — it would mean a \$200,000 qualified investment in the business. If four owner-operators joined together, it could mean building up to \$800,000 qualified investment in a business over a ten-year period. In any event, the limits which are established should require review from time to time to ensure they were appropriate to changed conditions.

An individual owner-operator should be reasonably well established at a \$200,000 qualified investment and be in a position to use funds for expansion on the same basis as others. From that point on, it will be the general tax climate which will be of paramount importance. As mentioned previously, specific small business arrangements should not have to compensate for inappropriate rules relating to savings and investment generally.

### Recovery of Incentive

The present and Senate proposed low rate and the Commons incentive are permanent, the reduced corporate tax need never be paid. The Commons report would impose a higher tax on dividend distribution because of the lower corporate tax. However, neither report suggested any offsetting capital gains provisions in recognition of their small business recommendations. In contrast, the Ontario Government proposes recovery of the full business tax credit.

If there is to be such recovery, an offset is necessary to avoid the serious effects which could occur with the 50 per cent tax rate applicable to the amount received on any disposal or withdrawal of the investment. For this reason, it is essential there be a rollover on reinvestment of the proceeds from the qualified investment, subject only to rules to prevent abuse. This would be a minimum,

and a preferable approach would be broader rollover provisions.

In the case of smaller estates, the proposed recovery of the incentive at a rate of 50 per cent of the proceeds of the investment on which the incentive was claimed could prove too harsh. In such cases, it would be possible to provide, for example, that recovery be taxed at only 25 per cent as a deemed capital gain on death. The precise rules would depend upon decisions related to rollovers and estate exemptions.

### One or More Incentives?

It seems reasonably clear that if encouragement of owner-operators who are Canadian individuals is the prime purpose of the incentive, then the direct approach of a Canadian owner-operator investment incentive will provide the greatest impact as the primary incentive. If more is required, the way to achieve it is to moderate the limitation on the amount of incentive available. The possibility of additional incentives for specific purposes is discussed in Chapter IV.

### Commencement of New System

Careful consideration will be required on a number of administrative aspects if the new system is to run smoothly. The incentive is broadly conceived and should not be hemmed in by administrative limitations inappropriate to the social and economic objectives sought. Simple tests and methods for the vast majority of situations should only be complemented by more complex rules where this

is essential to ensure reasonable fairness and compliance in certain special cases.

As previously stated, the Ontario Government believes the new system will have reasonable balance after it has been in effect for a period of time. Special rules, however, may be required in the transition period.

No investment by the owner-operator prior to the start-up of the new system would qualify for the proposed investment-related incentives. Thus, there would be no revenue losses referable to investments made under the present system when different taxing arrangements have prevailed, as only new investments would qualify.

During the first few years of the new incentive system it may be necessary, in order to avoid risk of manipulation, to exclude from qualifying any business investment made in a not-at-arm's length transaction. This would reduce any incentive to manipulate within family groups. It would be desirable in the future — perhaps after a determined transition period, probably five years — to drop such a restriction or make it significantly less restrictive.

The ability of heirs to use the incentive to assist in acquiring an existing small business from the estate of the deceased owner would help avoid unnecessary sell-outs of Canadian businesses based on the need for cash to pay estate and capital gains taxes arising on death. It would be undesirable to make it more difficult for a person active in a family business to acquire that business than to acquire a business with which he had no previous connection.

### Some Examples

The following examples illustrate the workings of the credit and its recovery in the three basic types of owner-operator situation, and show the net advantage to the owner-operator compared with the present incentive.<sup>24</sup>

#### A. A Sole Proprietor

Investment during the year - - - - -	\$ 3,000
Business profits - - - - -	\$ 7,000
Other income - - - - -	\$ 500
Total income - - - - -	\$ 7,500
Tax payable, pre-credit - - - - -	\$ 800
Tax credit available, lesser of:	
i) Annual limit - - - - -	\$10,000
ii) 50% of investment - - - - -	\$ 1,500
iii) 50% of pre-credit tax - - - - -	\$ 400
Tax payable after credit - - - - -	\$ 400
Increased investment utilized for credit - - - - -	\$ 800
Adjusted cost basis of investment for	
determination of future capital gains	
tax or recovery of credit - - - - -	\$ 2,200
Increased investment carried back or forward - - - - -	\$ 2,200

<sup>24</sup>The examples assume a married taxpayer with two dependent children.

The credit would represent an incentive not available to the proprietor under the present system. In the case of a farmer it would be an additional incentive to investment over and above the continued use of the cash basis method of determining income enjoyed under the present system.

B. An Active Partner

Acquisition of interest in partnership - - - - -		\$15,000
	<u>Amount</u>	<u>Tax</u>
Share of accrual basis profits - - - - -	\$15,000	\$ 3,100
Share of cash basis profits (where applicable) - - - - -	\$10,000	\$ 1,500
Tax credit available only if filing		
on an accrual basis, being the lesser of:		
i) Annual limit - - - - -	\$10,000	
ii) 50% of investment - - - - -	\$ 7,500	
iii) 50% of pre-credit tax - - - - -	\$ 1,500	\$ 1,550

The credit would represent an incentive not available to a partner under the present system. The partner would have the option of filing on a cash basis (where he is entitled to do so as a farmer or professional) and paying \$1,500 of current tax as under the present system or filing on an accrual basis, paying \$1,550 in current tax and reducing the cost basis of his investment for capital gains tax and tax credit recovery purposes by \$1,550.

C. A Majority Shareholder

Investment in corporation - - - - -		\$30,000
Profits of corporation before salary and tax - - - - -		\$25,000
Salary - - - - -		\$25,000
Corporate profit - - - - -		\$ 0
Personal tax, pre-credit - - - - -		\$ 7,100
Reinvestment in the corporation by way		
of further shares or debt - - - - -		
		\$ 9,000
Tax credit available being the lesser of:		
i) Annual limit - - - - -	\$10,000	
ii) 50% of investment		
(\$30,000 + \$9,000) - - - - -	\$19,500	
iii) 50% of pre-credit tax - - - - -	3,550	\$ 3,550
Increased investment utilized for tax credit - - - - -		\$ 7,100
Adjusted cost basis of investment - - - - -		\$31,900
Increased investment available for credit		
in subsequent years - - - - -		
		\$31,900

- After personal tax of \$3,550 and further investment in the company of \$9,000, \$12,450 is available for personal use.
- Under the present lower corporate rate system, the taxpayer would have somewhat less available for investment in the corporation if he drew a salary of \$15,500 to provide him with after-tax personal funds of approximately \$12,500. This would leave \$9,500 of earnings to be taxed in the corporation for after-tax earnings of \$7,300.
- If he should sell his investment in the following year at the value shown in the books of the company he would realize - - - - - \$39,000
- which when compared with the adjusted cost basis of his investment of - - - - - \$31,900
- would give rise to a gain of - - - - - \$ 7,100
- and a tax (at 50%) of - - - - - \$ 3,550
- The \$3,550 of tax credit would therefore be fully recovered.

IV OTHER MATTERS RELATED TO SMALL BUSINESS TAXATION

There are a number of other matters related to the taxation of small business which merit discussion in the context of the Ontario approach to the need for Canadian savings and

investment and of the small business incentive proposed in this paper.

Farmers

The federal white paper proposes retention of the cash method of reporting for farmers.

Farmers who qualify as owner-operat (taxpayers who farm as a hobby would meet the normal test of an owner-operat should also have the option of taking adv tage of the new small business incentive is to their advantage to do so. Tradition farmers have faced severe cash problems w almost all their assets tied up in fixed inve ment. If the new small business incenti and existing provisions relating to inve ments of farmers are not adequate to h farmers meet these cash problems, addition changes by way of faster write-offs or inve ment credits may prove desirable. The c tinued efficiency of Canadian farming v depend on the ability of Canadian farm to finance even greater fixed investment the future than in the past. This is an imp tant priority which the reformed tax syst must reflect.

Other Possible Incentives

More specific incentives in selected areas m be possible and desirable in addition to small business incentive. There are a num of possible devices which could be explo from time to time in relation to particu objectives, such as:

- a permanent carry-forward class of h technology or innovation expenditures si lar to the mining exploration and p production expenditures;<sup>25</sup>
- a lower effective rate of tax;
- accelerated capital cost allowance, inv ment credit or deduction of 150 per c of a qualified expenditure (such as former scientific research tax incenti and
- special treatment of stock options to employees similar to principles of p posed small business incentive.

In addition to Canadian owner-operat there may be particular business activitie many of which will fall into the small b ness category – which it is especially desi to stimulate in order to achieve more se tive objectives than the general one of couraging small business. These might clude businesses new to Canada, busine new to a disadvantaged region in Cana high technology businesses, heavy exp type businesses, or Canadian-identity b nesses like books or films. In such cases b entrepreneurial capital and the passive vestor might also benefit, with related ben to Canadian small business.

<sup>25</sup>This would only be applicable in those case where the present five-year limit for the carry-forward of business losses is insufficien



In particular, additional encouragement may be needed for innovative small businesses. Such businesses are often better able to respond more quickly to market changes than a large corporation and, therefore, may be better placed to introduce and market an innovation, provided they are able to obtain sufficient capital. Many of the major innovations of the present century — penicillin, the jet engine, television, radar, the Polaroid camera, and xerography, for example — were the result of an individual's initiative and assistance in developing a market for a new product. We share the view of the U.S. Department of Commerce on this matter:

From a number of different points of view, we are persuaded that a unique cost-benefit opportunity exists in the provision of incentives aimed at encouraging independent inventors, inventor-entrepreneurs, and small technologically based businesses. The cost of special incentives to them is likely to be low. The benefits are likely to be high.<sup>26</sup>

#### Canadian Development Tax Incentive Plan

Among many possible approaches is an adaptation of the owner-operator investment-reduced approach of the small business plan by establishing a Canadian development capital investment tax credit plan. This incentive could be aimed at Canadian individuals or intermediaries like mutual funds whose only orders were Canadian individuals. Businesses in which investment would qualify for a tax credit could be those whose ownership met similar tests to those now mandatory for banks, trust companies and broadcasting companies — that is, not more than 25 per cent ownership in the hands of non-residents. This approach to Canadian development may be contrasted with a government corporation like the proposed Canada Development Corporation. This approach would centralize investment decisions in the general areas identified for special incentive, opposed to even more centralization in the other government bureaucracy. It would be a positive approach to increased Canadian ownership by facilitating the investment itself by individual Canadians in those areas where there is a special public interest in development by Canadians. It would involve no discrimination against non-residents in the same business, as all businesses would be taxed in the same way, regardless of their ownership. The approach is neither negative nor protectionist. It would do no more than make

capital somewhat more accessible to Canadians in competition with non-residents, many of whom have significantly more capital to draw upon. It would be more efficient than the across-the-board decrease in the taxation of dividends which would result from both the full integration and half-integration proposals of the federal white paper. It would not be open to the charge made against the federal proposals that they were discriminatory in international investment.

There are many possibilities. The incentive could supplement the proposed tax credit for Canadian owner-operators. Or it could be an alternative, depending on how strong an incentive is desired. It could be structured to benefit Canadian individuals, while encouraging the pooling of savings in the hands of Canadian risk capital intermediaries. Of course, great care would need to be taken in choosing areas for the incentive, and its effectiveness would need to be reviewed to ensure the results merited the incentive.

#### Full Integration Benefits for Smaller Business

At this point, given the views of the Senate and Commons Committees, and of the provincial governments, including the Ontario Government, it seems quite clear that full integration will not be a general feature of the reformed federal system. The Ontario position is that there should be no integration as such, and that any general incentive to invest in Canadian equity shares should be simple and direct (like the dividend tax credit), without resort to complex procedures or theories about who really pays the corporate tax. Nonetheless, the *Ontario Proposals* expressed belief in the possibility that some new approaches were possible in dealing with those smaller companies which are similar to unincorporated proprietorships and partnerships.<sup>27</sup>

The Commons Committee did recommend that a partnership option be available for small closely-held corporations (a distinction the Commons Committee would keep for this purpose and for small business relief) and full integration for the first \$50,000 of annual taxable income for Canadian closely-held corporations controlled by Canadian residents. This type of integration would benefit passive investors as well as owner-operators and, unless restricted, could result in a greater than \$50,000 cumulative benefit to an individual investor in several closely-held corporations. These effects do not seem necessary or desirable.

#### Alternative to Commons Committee Proposal

An alternative approach consistent with the thinking of the Commons Committee but more in keeping with the owner-operator type of incentive would be to make integration a privilege of individual Canadian owner-operator shareholders, rather than relate it to a type of corporation. The reason for some measure of full integration is to try to equalize the tax position of the small incorporated business with the small proprietorship or partnership. This argument has merit when considering the owner-operator shareholder of a corporation but has little or no merit when considering the passive investor in that corporation. This equalization is not as important an objective for the Ontario Government as it seemed to be for the federal government in its white paper. This is because incorporation is not difficult, and, if the cash method were continued for professionals, who sometimes cannot incorporate, there would be little practical reason for concern about different treatment between incorporated and unincorporated business by reason of a tax on dividends. On the other hand, practical integration can and will be achieved for owner-operators to the full extent of justified salaries. Beyond that, it seems reasonable for owner-operators, in their role as investors, to be taxed on dividend distributions on the same basis as any other investor — that is, taxed on dividends subject to a general dividend tax credit.

The alternative approach would rest on three principles:

- for personal business income of up to say \$50,000 a year, there is validity in the feeling there should be little tax difference between an incorporated and an unincorporated business;
- business income that really reflects personal services should be taxed on essentially the same basis as all personal income, namely at personal rates, and not be subject to two taxes, once in the corporation and once in the hands of the individual shareholder. When business income climbs beyond the personal service element, all corporate business income should be taxed alike — once in the corporation and once in the hands of the shareholder subject to dividend tax credit to Canadian resident individual shareholders; and
- all corporations should be treated the same, and any incentive relief should be to individual Canadian shareholders only.



The tests for qualification could be identical to the owner-operator qualifications required for the proposed small business incentive. Possible techniques would include any one or all of the following:

- a "safe-haven" salary approach. Any individual taxpayer qualifying as an owner-operator could take out say \$50,000 as salary — thus a deduction from company income — and no question of justification of the propriety of salary would be raised. This would be \$50,000 aggregate of all salaries and business income of a particular owner-operator. On the other hand, larger salaries could be permitted where justifiable as a reasonable business expense;
- a partnership election by the individual owner-operator whereby up to \$50,000 of business income and salary is deemed his income and salary and credit for corporate tax paid on appropriate portion is allowed. Again, the maximum limit would be \$50,000 of all such business income and salary from all sources; and
- a personal integration right of up to \$50,000 (minus salaries and other business incomes) in respect of actual dividends received from all companies in which the taxpayer is an owner-operator.

The practical effect of this approach would be that a qualifying taxpayer could elect to be taxed at personal rates only on annual income up to \$50,000. Beyond that, he would have to receive and justify a higher salary as reasonable, or would be subject to tax on dividend distributions on the same basis as other investors.

#### Cash Method of Reporting Income

The present system permits a professional or a farmer to report his income on a cash basis. The white paper proposed its withdrawal for the professional, the Senate Committee recommended retention, and the Commons Committee recommended a mid-position. However, as these taxpayers are themselves owner-operators, they would be able to take advantage of the proposed incentive. Certainly, it would be inconsistent to offer special taxing arrangements to small business to replace the present low rate, and not recognize the parallel to the professionals, whom the federal white paper proposed to tax on money they have not yet received.

In effect, the present cash basis for most professionals is not as favourable as the present lower rate of tax, for two reasons.

First, it is unlikely that \$10,000 annual tax will be deferred each year, year after year, as is the case with the lower rate. Second, there is almost always a day of reckoning when the receivables and work in process are recovered at the end of the road. Even the present cash basis for most professionals would not be as favourable as an annual \$10,000, lifetime \$100,000, tax credit for smaller business. Very few, if any, individual professionals would reach a position of having \$200,000 of untaxed accounts receivable and inventory on hand at any one time. Yet the cash basis is an extremely simple method that puts self-employed professionals on the same tax basis as employed professionals, and on a similar basis to small corporations. Many professionals do not have substantial investment in other than accounts receivable and inventory, which are fully taken care of by the cash method. These considerations argue for retention of the present cash method, which would maintain rough equivalence between professionals and those able to take advantage of the proposed small business incentive. It would be possible to give professionals the right to elect to go on an accrual basis and take the small business incentive instead if this seemed desirable. This approach would eliminate any question of advantage or disadvantage between professionals who cannot incorporate and those businessmen who are able to incorporate and who would be able to get the proposed new small business incentive.

#### V SAVINGS AND INVESTMENT

The Ontario approach reflects greater concern than the federal proposals about the general savings and investment effects of tax reform on economic growth. The small business incentive proposed in this paper reflects this concern and is intended to operate as part of the general reformed system advanced in the *Ontario Proposals*. This Chapter explores the Ontario system, partly in relation to the tax system comparison contained in Chapter II, and partly in relation to the small business incentive proposed in Chapter III.

As a first stage, the Ontario approach is to modify the existing tax structure affecting business and investments in two main ways. First, Ontario's proposed rate schedule reduces the top rate to 65 per cent.<sup>28</sup> The Ontario decision to keep the top rate signifi-

cantly above 50 per cent and to reject integration proposals has the merit of reducing the tendency to move to the personal rate structure implicit in the federal white paper. Second, changes in the taxation of corporations and shareholders would eliminate loopholes and increase the dividend credit slightly to the benefit of low and middle-income groups. It would then introduce a moderate but fully separate capital gains tax and reduce estate taxation in order to achieve a level of capital taxation which will not reduce savings or discourage enterprise in the creation and expansion of business by Canadians.

#### Federal White Paper Impact

If the federal white paper proposals of a top 50 per cent rate were adopted, there would be a powerful tendency for business to seek access to the personal rate structure in order to avoid any double taxation of corporate source income inherent in the federal integration proposals. This would not only create business distortions and revenue loss but would largely eliminate the tendency of the present system to encourage earnings retention for business growth. When added to the heavier taxation of capital of the federal approach, there would be a significant shift in the balance of influences towards consumption and away from savings. The Ontario Government's view is that small business cannot hope to thrive in such a climate.

#### Capital Gains

The Ontario Government's approach to capital-gains taxation is generally less severe than the federal proposals on all capital gains except short-term gains and gains of traders in shares of Canadian widely-held companies and those in the hands of well-to-do individuals from their shares in mature non-growth private companies.<sup>30</sup> However, like the present system in relation to corporate surplus, and the federal white paper proposals in relation to capital gains on death, the *Ontario Proposals* for deemed realization of capital gains at death and reduced estate taxation face squarely the issue of the appropriate level of all capital taxation at death.

#### Rollovers

Any form of capital gains taxation based on the realization principle, as proposed by the Ontario Government, may impede economically desirable transfers. The *Ontario Pro*

<sup>28</sup>This contrasts with the federal white paper and Senate Committee proposals of a top rate of 50 per cent and the Commons Committee proposals of a top rate of 60 per cent. See, *Ontario Proposals*, op. cit., page 20; and *Staff*

*Paper*, Effects of Ontario's Personal Income Tax Proposals. *Ontario Studies in Tax Reform* 2, (Toronto: Department of Treasury and Economics, December, 1970), page 18.

<sup>29</sup>The Ontario proposals would tax these gains up to 65 per cent as income, whereas the top rate under the federal proposals would be 25 per cent.



recognized this and called for provisions to facilitate necessary and desirable changes in the ownership of capital assets. They also recognized general problems of economic efficiency and expressed a willingness to consider variations in the general framework which would assist in their solution.

The basic solution to these problems lies in appropriate rollover provisions. One approach is to restrict rollovers stringently, in which case many economically desirable transfers are almost certain to be impeded. This was the approach of the federal white paper, except the almost unanimously disapproved five-year revaluation proposal was regarded as a sufficient protection to allow tax-free rollovers in the case of widely-held shares. Another solution is to widen the rollover provisions in which case many normal decisions will be distorted in order to come under the umbrella of the tax-free rollover. This is basically the United States approach. This has led to takeovers and mergers in which an exchange of shares takes the place of cash payment, with results that are not always satisfactory.

The *Ontario Proposals* do not take a specific position on rollovers, but leave the matter open for discussion. Ontario favours the broadest possible rollovers to minimize distortion as an influence in investment decisions. One alternative, as it affects small business, is to permit a rollover on any sale of shares by an owner-operator in a small business, or of the small business itself, provided the proceeds are reinvested. This would completely eliminate any tax impediment to going public or merging or selling-out to a larger company. Any such decision could then be based solely on considerations of economic merit, which would eliminate the type of distortion that occurs under the United States system of tax-free share exchanges.

If a broader rollover than in the United States seems desirable for small business, the next question is whether it would be sound to exclude real assets and public company shares from a reinvestment rollover approach. There is no question that the need for both private savings in Canadian hands and capital market efficiency strongly favours a reinvestment-related tax-free rollover approach for shares and business assets. With deemed realization on death, an important equity argument against the approach is substantially lightened, especially if one regards the taxation of capital as more appropriate having

a lifetime perspective, in comparison with the taxation of income or consumption, which may more appropriately be on a current basis.

### Long-Term Structure

The *Ontario Proposals* are based on the central importance of savings and investment for economic growth as the only reliable generator of increased revenues to governments. Thus, the Ontario Government does not believe in designing a long-term structure on the basis of short-run revenue considerations. For any rollover will only delay the collection until the gain is realized in spendable form or the taxpayer leaves the country or dies. Nonetheless, the question arises as to the likely revenue impact of granting wide rollover privileges during the lifetime of the taxpayer based on reinvestment. It seems unlikely to be great. Full taxation of short-term and trading gains and taxation of gains realized in spendable form would be unaffected. So would the deemed realization of gains on death. Moreover, the Ontario gains base would be higher than under the federal proposals, because it would include accrued gains on death and retained earnings. Also, the Ontario proposed dividend tax credit would be less generous to high-income taxpayers than either the federal proposal for full integration for closely-held corporations and half-integration for Canadian widely-held corporations, or the half-integration proposal for all Canadian corporations advanced by the Commons Committee.

It is important to note that the Ontario Government expects an annual net revenue gain of only \$100 million from the combined taxation of estates and capital gains as a result of its national tax reform package.<sup>31</sup> As some capital gains would, in any event, be used for consumption, not reinvestment, any adverse general impact on Canadian savings should be moderate and acceptable. A general reinvestment-related rollover would further favour savings over consumption. In assessing this net revenue gain, it is to be noted that the integration revenue losses proposed by the federal white paper were regarded as unnecessary and undesirable by the Ontario Government. Under the *Ontario Proposals*, the revenue expected from capital gains would not, as under the federal white paper, be offset by reduced revenues from what the Ontario Government regards as an unnecessarily generous reduction in the taxation of current dividends and other corporate distributions.

### Encouragement to Canadians

The Ontario approach seeks fairness and moderate revenue gains from introducing a capital gains tax, without requiring damage to savings or investment in general or to the dynamics of Canadian small business in particular. They reflect fully the view that a dynamic economy is the only source of lasting revenue gains that are compatible with bearable tax levels. While the Ontario capital gains and related estate tax reduction proposals have not been presented in full detail, the views expressed in this chapter point the way to a reformed tax system which, with the addition of a sound incentive to small business, would effectively encourage investment by Canadians in the economy of their country.

## VI CONCLUSION

The Ontario Government is satisfied that its proposals relating to savings and investment and the taxation of corporations and shareholders constitute the best basis for sound and workable tax reform which will contribute to the efficient growth of the Canadian economy.

The Ontario Government has proposed a novel small-business incentive to replace the present dual rate of corporate tax. The proposal reflects Ontario's conviction that broad social and economic benefits can flow from encouraging Canadians to own and expand their own businesses. The focus on the individual Canadian owner-operator as the person to get the incentive constitutes a powerful long-term encouragement to the development of the Canadian economy by Canadians.

The Canadian economy will continue to need foreign capital for its efficient development. The Ontario approach to the taxation of business and investment is based on facilitating capital investment by Canadians, without any discrimination against international business investment. This is important in the face of a world shortage of capital and developing protectionism in many countries. Canada has a major stake in reasonably free international trade and capital movements. For this reason, Canadian tax policies should not be inward-looking.

Most important of all, the Ontario Government hopes that the approach and proposals of this paper will be carefully considered by the federal government. Ontario is fully prepared to discuss these proposals at both the ministerial and official levels.

*If the only gains reflected retained earnings, there would normally be no tax under the federal proposals, but a 25 per cent capital gains tax would be payable under the Ontario proposals.*

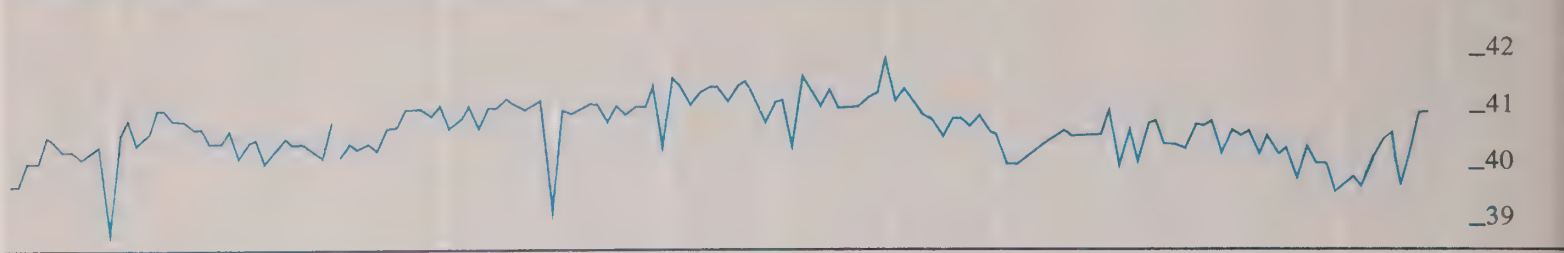
<sup>31</sup>Ontario Proposals, op. cit., page 45.



# Selected Economic Indicators

## Leading Indicators

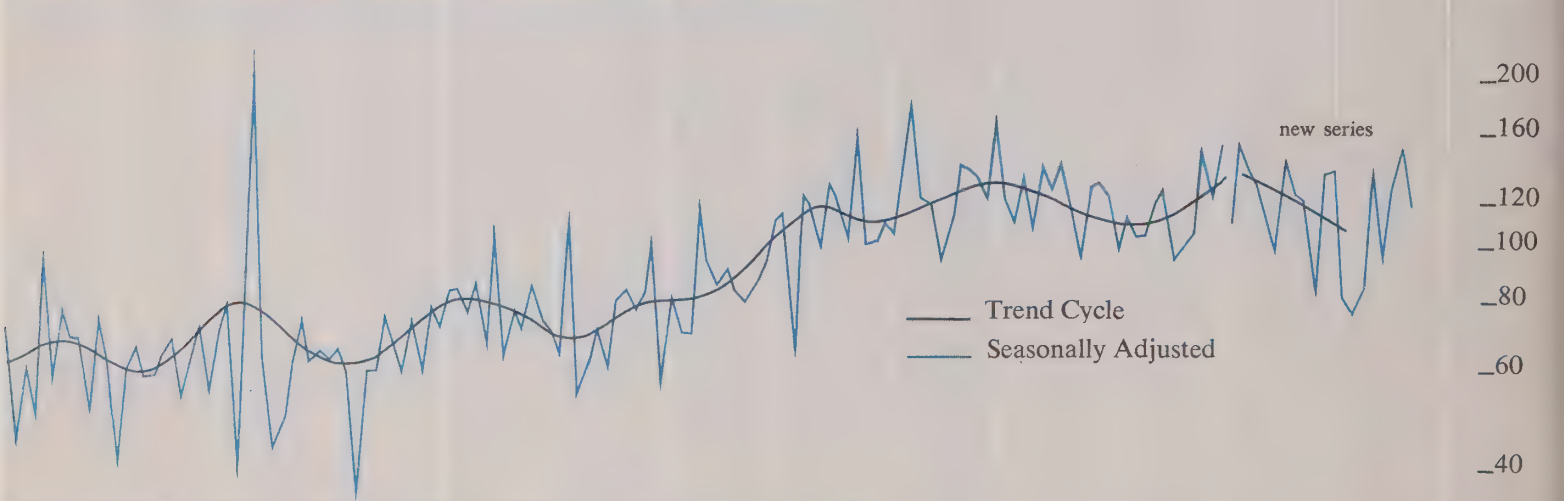
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted) Number



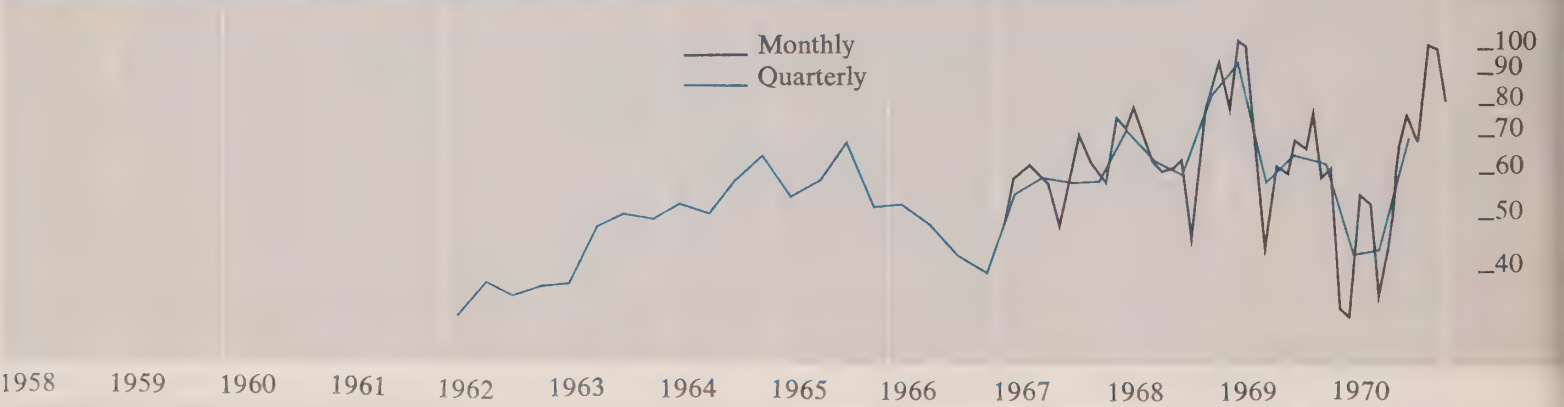
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted) \$ Billion



Commercial/Institutional and Industrial Construction Contracts, Ontario \$ Million



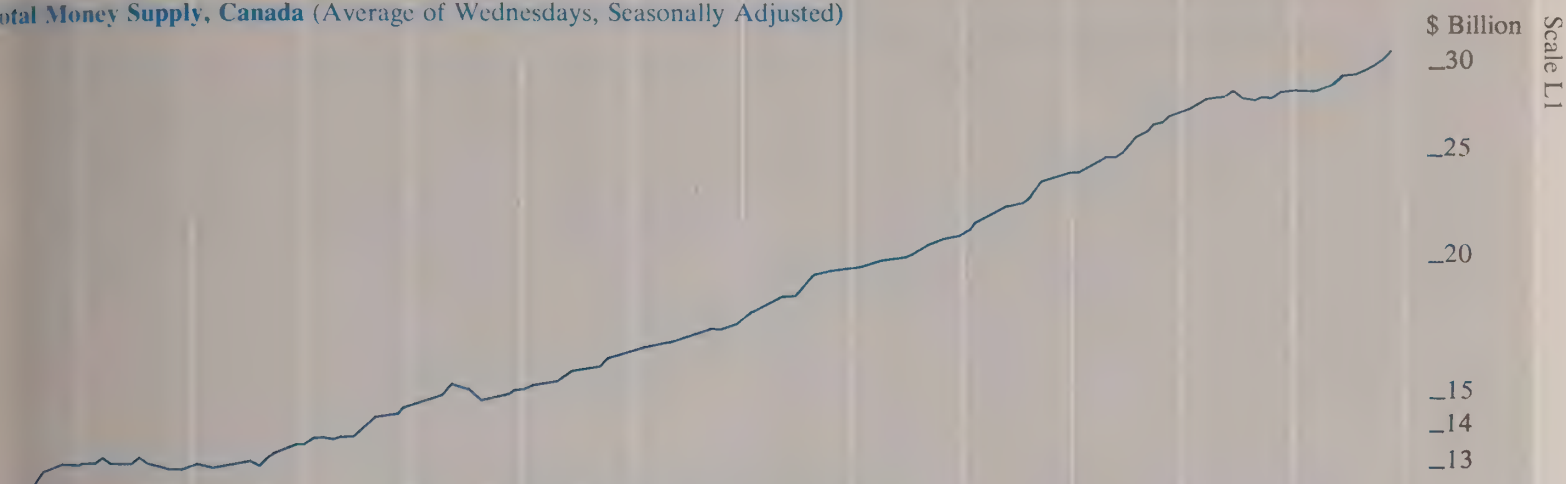
Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates) Thousand





## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

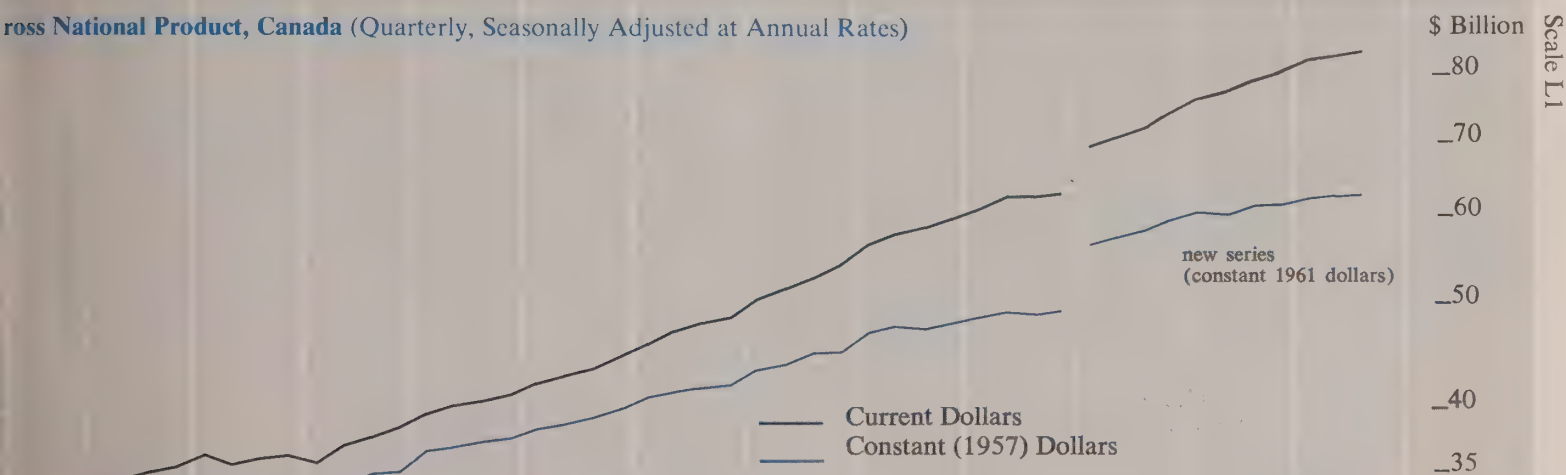


**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

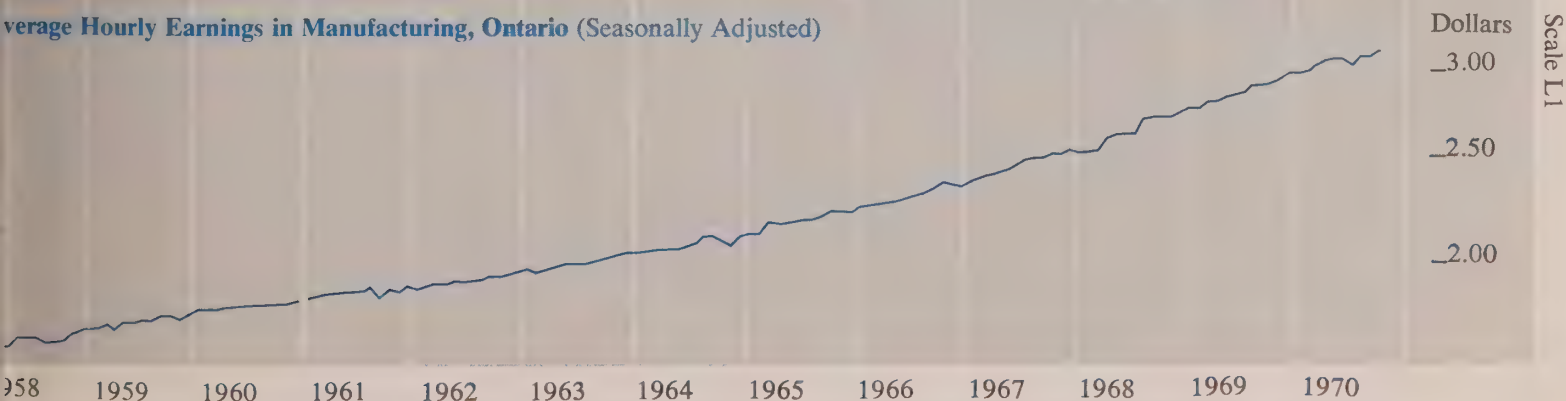


## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)





# Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



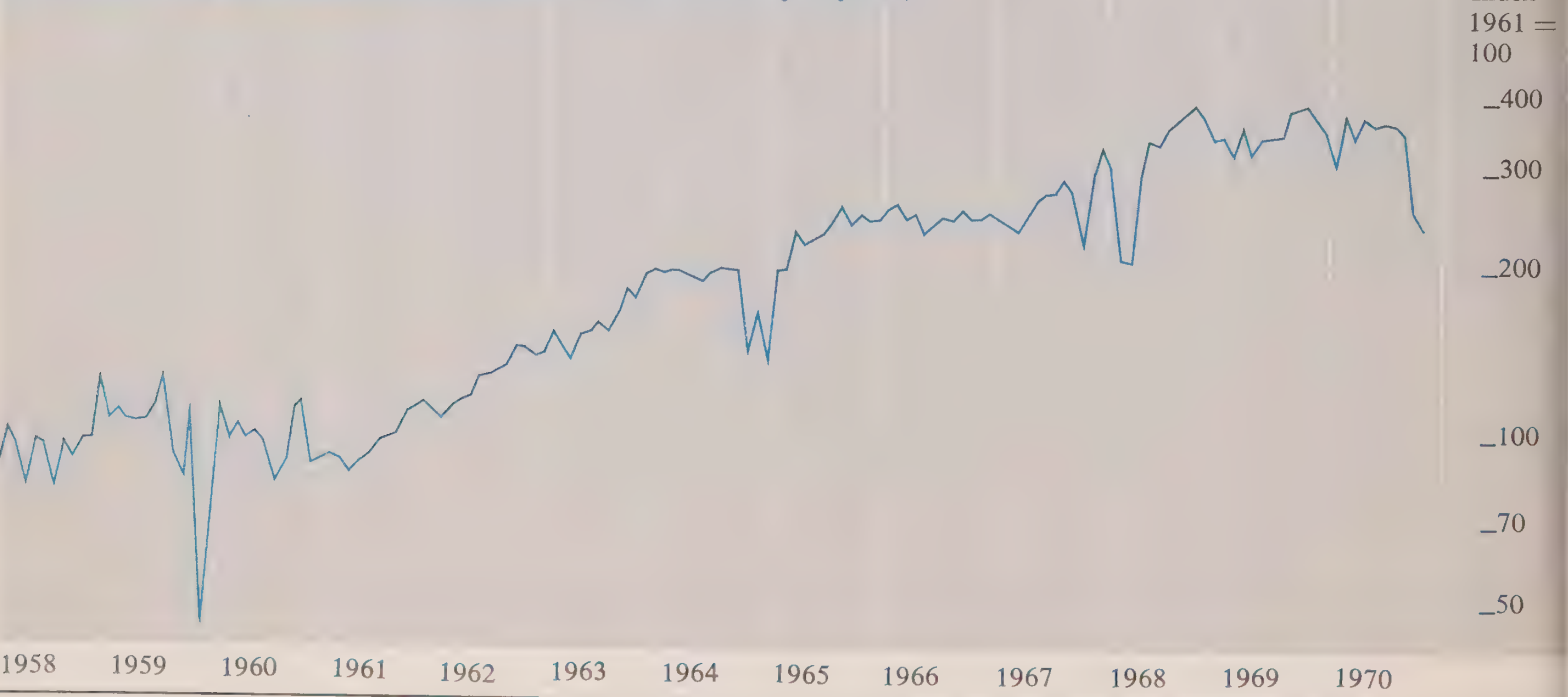
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)





	1970													
	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	39.9	39.4	39.6	39.7	39.5	40.0	40.3	40.4	39.3	40.1	41.0	41.0		
New Orders in Manufacturing Industries <sup>c</sup>	3,754	3,728	3,662	3,696	3,604	3,650	3,774	3,851	3,804	3,883	3,754	3,697	3,690	
Commercial/Institutional and Industrial Construction Contracts	137.3	140.0	72.1	78.4	87.2	142.2	97.4	130.4	159.4	120.2	118.3	112.4	66.6	
Urban Housing Starts (Annual Rate)	59,100	64,700	34,800	33,600	55,700	53,900	37,200	45,200	67,500	77,500	69,200	106,000	103,800	82,300
Money Supply <sup>c</sup>	28,580	28,917	28,955	28,947	28,817	28,966	29,223	29,668	29,769	29,996	30,132	30,549	31,268	
T.S.E. Industrial Index <sup>u</sup>	187.65	186.37	177.89	183.92	185.17	171.08	154.21	151.53	157.36	160.28	165.8	162.1	168.7	174.4
Business Failures <sup>u</sup>	54	53	56	71	82	54	65	77	73	48	55	71	74	71
Business Failures — Liabilities <sup>u</sup>	4.6	2.2	9.9	18.7	4.0	2.2	3.4	8.1	3.1	2.8	5.3	8.1	5.8	7.7
Coincidental and Lagging Indicators														
Gross National Product <sup>c</sup> (Annual Rate)		80,888			82,680			83,076				84,120		
Average Hourly Earnings in Manufacturing	3.02	3.06	3.06	3.05	3.11	3.17	3.19	3.19	3.16	3.22	3.22	3.25		
3-Month Treasury Bill Rate <sup>c,u</sup>	7.76	7.81	7.78	7.60	7.00	6.78	6.34	5.94	5.70	5.51	5.39	5.01	4.40	4.46
Cheques Cashed in Clearing Centres <sup>1</sup>	6,521	6,240	6,078	6,099	6,661	6,487	6,313	6,386	6,358	6,774	7,184	7,007	6,464	
Retail Trade	895	909	891	869	884	906	904	887	918	902	930	895	905	916
Labour Force	3,030	3,064	3,044	3,066	3,098	3,111	3,183	3,173	3,122	3,130	3,158	3,179	3,175	3,148
Employed	2,927	2,957	2,948	2,957	2,981	2,977	3,037	3,038	2,976	2,992	2,998	3,033	3,018	2,988
Unemployed	103	107	96	109	117	134	146	135	146	138	160	146	157	160
Unemployed as % of Labour Force	3.4	3.5	3.2	3.6	3.8	4.3	4.6	4.3	4.7	4.4	5.1	4.6	4.9	5.1
Wages and Salaries	1,487	1,503	1,529	1,549	1,550	1,547	1,571	1,586	1,583	1,600	1,596	1,595	1,603	
Index of Industrial Employment	132.7	132.8	132.1	133.0	132.7	132.1	131.7	131.4	131.1	131.7	130.2	130.0	129.3	
Index of Industrial Production <sup>c</sup>	169.3	172.0	171.1	174.4	171.5	172.4	170.5	170.2	170.0	171.0	169.1	169.3	171.5	
Total Manufacturing <sup>c</sup>	169.5	170.7	167.8	171.0	168.1	170.0	167.5	167.4	165.4	166.5	163.1	163.3	165.4	
Non-Durables <sup>c</sup>	153.4	154.3	152.3	154.3	152.8	154.8	155.0	152.4	152.8	151.8	152.2	154.6	158.7	
Durables <sup>c</sup>	189.2	190.7	186.8	191.4	186.7	188.6	182.8	185.8	181.7	184.4	176.4	173.8	173.5	
Mining <sup>c</sup>	151.8	163.4	170.2	175.7	170.6	164.2	166.6	170.8	173.4	174.6	178.2	176.8	181.0	
Electric Power and Gas Utilities <sup>c</sup>	194.6	197.0	201.0	203.0	203.0	206.4	203.7	205.1	206.1	205.9	208.4	211.4	211.3	
Primary Energy Demand (Annual Rate)	59.56	63.13	64.53	63.91	62.94	63.39	61.60	63.35	65.03	65.68	66.80	65.56	64.32	66.79
Exports (including re-exports) <sup>c</sup>	1,285.0	1,328.9	1,447.0	1,402.1	1,410.1	1,439.0	1,434.1	1,392.2	1,422.7	1,321.1	1,391.3	1,416.0	1,479.8	1,312.0
Imports <sup>c</sup>	1,223.2	1,215.0	1,116.8	1,230.6	1,242.6	1,191.6	1,207.1	1,182.5	1,187.5	1,162.3	1,184.5	1,066.0	1,138.0	
Unclassified Indicators														
Foreign Exchange Reserves <sup>c,u</sup>	2,613	2,616	2,698	2,777	2,936	3,179	3,406	3,650	3,689	3,848	3,785	3,831	3,874	
Industrial Materials Price Index <sup>c,u</sup>	267.8	271.5	272.3	272.3	275.7	274.4	273.7	271.5	270.3	268.5	269.2	267.4	266.4	
Consumer Price Index <sup>c,u</sup>	127.4	127.9	128.2	128.7	128.9	129.7	129.6	129.9	130.5	130.5	130.2	130.3	130.3	129.8

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.







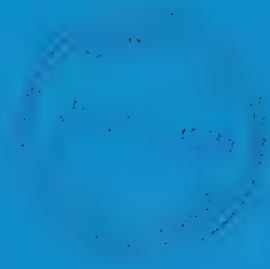
# Ontario Economic Review

March/April 1971  
Volume 9, Number 2

Department of Treasury and Economics

Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

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## The Ontario Economy

### Reflation, Retrenchment and Reform:

R. G. Holloway, *Economist*  
Department of Treasury and Economics

### Britain's New Fiscal Policies

### Price Changes 1961-1970: An Economic Analysis

John Burkus, *Director, Corporate Planning and Research*  
Ontario Housing Corporation

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. W. Darcy McKeough  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

#### About The Review

The feature article for the March/April edition of the *Ontario Economic Review* presents an analysis of price changes over the period 1961 to 1970.

During the course of the past few years, Canadians have been engaged in discussing the nature, causes and extent of price increases and inflation. While all aspects of price changes are not analyzed in this report, policy issues are examined in the light of historical price series. The statistical material and related analysis is contemporary to about the third quarter of 1970. In some instances data for the full year 1970 has been incorporated.

Originally this report, which is a summary of a larger study, was prepared for use within the Department; however, in view of the nature of the data, it was decided to publish the material in its present form.

The article was prepared by John Burkus, Director of Corporate Planning and Research with the Ontario Housing Corporation, and until recently a senior economist in the Economic Planning Branch, Policy Planning Division, Department of Treasury and Economics.

In a short article on Britain's new fiscal policies, R. G. Holloway of the Taxation and Fiscal Policy Branch, Department of Treasury and Economics outlines the aims and coverage of the recent U.K. tax reforms.

The material for the review of the Canadian Economy in 1970 was prepared by the Aggregate Analysis, Forecasting and Planning Section of the Economic Planning Branch.

#### Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some may change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## Canadian Economy in 1970<sup>1</sup>

Revised estimates of the first three quarters and preliminary estimates for the fourth quarter indicate an accelerating pattern of growth during 1970. The gain in the fourth quarter was particularly strong. Thus, Canada's gross national product rose by 7.5 per cent, to \$84,468 million. The implicit price deflator rose by 4.1 per cent. Although this was less than the 4.7 per cent price increase in 1969, it was still one of the largest experienced in recent years. After discounting the effect of price increases, the physical volume of production rose by 3.3 per cent. It is likely that the fiscal and monetary policies adopted by the federal government in 1969 contributed to the slowing in the growth of incomes and domestic demand in the first half of the year. Also, these policies of restraint contributed to a moderation in price increases except in the first quarter when the index rose by 2.0 per cent. Similarly, the easing of restraints in the early part of 1970 appears to have stimulated a recovery of demand in the second half of the year. However, the moderate growth of 1970 could not have been achieved, without the outstanding performance of the export sector. The spectacular growth of exports in the first quarter, and their continuing strength through the remainder of the year provided far the greatest stimulus to the economy in 1970.

Although the rate of price increase slowed during the year, cost pressures do not appear to have eased. Corporation profits declined for a number of reasons including numerous work stoppages, and the adverse effect on export-oriented industries of the appreciation of the Canadian dollar. Increases in employment were insufficient to absorb the rapidly increasing labour force, leaving unemployment rates to 5.9 per cent.

### Gross National Product

In the fourth quarter the total value of production rose by \$1,388<sup>2</sup> million dollars, or 7.5 per cent. While this was not a spectacular rate of growth, it is more impressive when the price factor is eliminated, yielding a real rate of growth of 1.5 per cent (6 per cent on an annual basis).

Earlier estimates had indicated substantial strength in the first quarter, the result of very strong export demand. However, revisions to the implicit price deflator, including a correction to the implicit price index of exports, indicate that in spite of the boost from

## Gross National Product – Quarter to Quarter Percentage Changes<sup>1</sup>

	1969				1970			
	I Q	II Q	III Q	IV Q	I Q	II Q	III Q	IV Q
Gross National Product (Current dollars)	3.1	1.3	2.4	2.1	2.1	1.4	1.4	1.6
Gross National Product (Constant 1961 dollars)	1.6	-0.7	2.1	1.4	0.1	0.7	0.6	1.5
Implicit Price Index	1.5	2.0	0.3	0.7	2.0	0.6	0.8	0.1
Implicit Price Index (Excluding nature of physical change in inventories)	1.4	1.7	0.9	0.6	1.4	0.8	0.8	0.4

a healthy export performance real growth in the first quarter was only 0.1 per cent. Thus, the accelerated growth of the subsequent quarters in the face of a lack of further growth in the export sector indicates a resumption of domestic demand. The recovery in the latter part of the year was aided by an exceptionally strong performance of investment, which increased by 4.4 and 2.8 per cent in the third and fourth quarters, after having experienced marginal declines in the first two quarters. Government expenditure on goods and services was another important sustaining force throughout the year. The 1970 increase of 15.5 per cent was the highest since 1966. Although consumer expenditure did not experience such a dramatic increase, it did rise in the last three quarters.

### Prices

The year-to-year change in the implicit price index was 4.1 per cent. While still very high by historical standards, this was a definite improvement over the 4.7 per cent price increase experienced in 1969. Although there is a conceptual difference between a currently weighted price index such as the implicit price index and base weighted price indexes such as the consumer price index and the general wholesale price index, these latter indexes exhibited the same pattern as the former – in fact showing even more substantial declines.

While the price indexes for most major categories of final expenditure recorded lower increases, the deceleration of the overall implicit price index was mainly the result of moderation from the second quarter onward in the rise of the index for personal expenditure on goods and of that for exports.

The implicit price index for exports rose by 3.3 per cent. The increase was concen-

trated mainly in the first quarter, which showed an exceptionally strong rise of 2.1 per cent. During the rest of the year there was very little rise in export prices. For many commodities, whose prices are determined in world markets, the freeing of the exchange rate in June 1970 caused a lowering of the price received by Canadian producers. However, the full implications of the appreciation of the Canadian dollar on domestic producers cannot be determined until the exchange rate is repegged. As had been expected, the increased value of the dollar eased the rate of gain of import prices.

The implicit price index for total personal expenditure rose by 3.2 per cent – a significant deceleration from the increase of 4.1 per cent recorded in 1969. Expenditure on durables was the only sector not experiencing a decline. However, the increase here was concentrated in the first quarter with the rest of the year showing no change. Expenditure on non-durables eased primarily because of declining food prices. This was the result of lower prices of food imports and the intense competition among large retail stores in the latter part of the year. While expenditure on services continued to rise at a higher rate than that of the other consumer sectors, an easing of rent prices reduced the increase to 4.4 per cent from 6.5 per cent in 1969.

### Consumption

Consumer expenditure on goods and services increased by 5.3 per cent, after an increase of 9.8 per cent in 1969. Since consumption expenditures represent approximately 60 per cent of Canada's gross national product, the influence that a 46 per cent reduction in the rate of growth of this component has on aggregate demand is obvious. As was expected, the principle weakness occurred in

<sup>1</sup>Tails concerning the performance of the Canadian economy in 1970 were obtained from Statistics Canada, National Income and Expenditure Accounts, Fourth Quarter and Preliminary Annual, 1970.

<sup>2</sup>Unless otherwise stated, all figures are seasonally adjusted at annual rates.

Selected Implicit Price Indexes — Quarter to Quarter Percentage Changes

	1969				1970			
	I Q	II Q	III Q	IV Q	I Q	II Q	III Q	IV Q
Personal expenditure on consumer goods and services	1.1	1.3	0.9	0.6	1.6	0.4	0.2	-0.1
Government current expenditure on goods and services	-0.5	4.6	2.3	1.6	-1.6	3.0	1.9	0.9
Business gross fixed capital formation	1.8	1.5	0.7	0.6	1.0	0.4	0.4	1.4
Residential construction	2.3	1.8	-0.7	—	1.2	1.2	1.2	1.7
Non-residential construction	2.6	1.8	1.7	2.1	0.6	-0.1	1.0	1.3
Machinery and equipment	0.8	1.0	0.9	0.1	1.2	0.8	-0.3	0.3
Exports	1.3	1.2	—	0.6	2.1	0.4	0.1	—
Imports	0.2	1.2	1.5	0.8	0.7	0.5	-0.8	-0.6
Gross national expenditure	1.5	2.0	0.3	0.7	2.0	0.6	0.8	0.1
Gross national expenditure excluding value of physical change in inventories	1.4	1.7	0.9	0.6	1.4	0.8	0.8	0.4

Source: DBS, National Income and Expenditure Accounts, Fourth Quarter and Preliminary Annual, 1970.

the purchases of consumer durables. It is with the more expensive durable goods items that the consumer has the greatest scope for discretionary spending, and 1970 saw a reduction in this area. For example, outlays on new passenger cars fell by 17 per cent. The decline in new car purchases was especially strong in the first quarter, gradually recovering in the second and third quarters but dropping again in the final quarter when sales were affected by the strike at General Motors. Other durable goods that showed declines were recreation equipment and home appliances.

The demand for semi-durable goods was also sluggish, especially for such items as clothing and footwear. The slowing of demand for services was largely due to the further extension of the medicare program which shifted most medical expenses from the personal sector to the government sector,

and contributed to the hefty increase of 15.5 per cent in government expenditure. Outlays on non-durable goods were supported by accelerated rises in electricity and fuel which experienced substantial increases in export demand over the previous year.

#### Investment

Investment for the year increased at a rate much in excess of what earlier statistics had indicated. This was due to the fact that the quarterly accounts are based on indicators, and in a year of change such as 1970, they were not very sensitive to the changing pattern of investment. Total gross fixed capital formation increased by 4.2 per cent. Government capital expenditures increased by 6.6 per cent, to \$3,252 million, while business gross fixed capital expenditure increased by a lesser 3.7 per cent. However, this gives a somewhat misleading picture since the average was pulled down substantially by an 8.0

per cent decline in residential construction. Business fixed investment excluding housing rose by 8.0 per cent, to a level of \$1,100 million. Business spending on non-residential construction was up 10.1 per cent, while expenditures on machinery and equipment rose by 6.2 per cent.

#### Income

Wages, salaries, and supplementary income again grew at a faster rate than the gross national product, up 8.9 per cent. GNP rose by 7.5 per cent. Higher average earnings were responsible for most of the increase in labour income. Service-producing industries absorbed most of the increase in employment which resulted in faster increases in this sector than in the goods-producing sectors. The slower increase in the goods-producing industries resulted in slower growth due to strikes. Thus, manufacturing only increased by 5.6 per cent. The largest increase occurred in machinery where a 17.5 per cent increase reflected the resumption of production following a strike in 1969.

Preliminary estimates indicate that corporation profits before taxes declined by 1.1 per cent. Corporation profits for the first three quarters remained essentially unchanged from the 1969 level. However, the 11.1 per cent drop in the strike-affected fourth quarter greatly influenced the year's performance. The rise of 9.3 per cent in capital construction allowances cushioned this somewhat, but gross profits (which include provision for depreciation) declined by only 0.1 per cent.

#### Exports and Imports

The greatest stimulus for the Canadian economy in 1970 originated in the foreign sector. These gains were concentrated in the first quarter, accounting for all of the increase in total demand. For the remainder of the year exports remained at about the 1969 level, increasing by 13.5 per cent for the year as a whole. Increases were especially strong in metals and in cereals. On the other hand, the strength was in the raw materials. Food, feed and beverages increased by 1.1 per cent, and inedible crude materials increased by 24.3 per cent. On the other hand, inedible fabricated materials increased by only 13.5 per cent and inedible end products by only 4.2 per cent. A notable feature of the expansion is the fact that it was directed primarily at countries other than the



# Income (Canada) — Quarter to Quarter Percentage Changes

	1969				1970			
	I Q	II Q	III Q	IV Q	I Q	II Q	III Q	IV Q
Wages and salaries	3.7	2.3	2.6	2.5	3.0	0.6	1.7	2.4
Personal income	2.1	3.2	3.2	1.7	1.7	1.1	1.4	2.4
Personal disposable income	1.8	2.0	3.2	1.0	2.0	-0.4	1.6	2.3
Corporation profits	3.0	-0.9	-6.3	0.2	2.0	-4.2	2.5	-11.7

Source: DBS, National Income and Expenditure Accounts, Fourth Quarter and Preliminary Annual, 1970.

es, which increased its imports from Canada by only 3.5 per cent. Canadian exports to the European Economic Community rose by 40.9 per cent, to the United Kingdom by 34.7 per cent, and to Japan by 1 per cent.

Because of the depressed level of economic activity in Canada, imports of goods and services virtually halted their rapid rate of increase of the preceding years. The greatest decline was in automobiles and parts, a result of both the auto workers strike and poor overall sales.

## Productivity Trends

In a recent statement on preliminary productivity trends for 1970 the Dominion Bureau of Statistics reports that in the private sector the Canadian economy productivity rose 1.1 per cent. This represents a significant improvement over the 2.2 per cent increase in 1969, however it is still below the 1965-1969 average annual increase of 3.5 per cent.

In the important manufacturing sector, productivity, defined in terms of output per man-hour, rose by only 1.3 per cent, the smallest increase in any year during the past decade. In 1969, the increase was 3.6 per cent and during the period 1965-1969, the average annual increase was 2.2 per cent. Services, on the other hand, showed a much better performance, with a 2.5 per cent gain in 1969 compared with a 0.6 per cent rise in 1969. For 1965-1969, the average annual increase was 2.2 per cent.

DBS notes that while there was some over-improvement in the private sector the

3.1 per cent gain in output per man-hour was still below the average annual growth of the nineteen sixties. For commercial industries as a whole total output rose by 2.4 per cent and the number of persons employed by six-tenths of one per cent. Man-hours worked declined by six-tenths of one per cent. While output per man-hour rose 3.1 per cent, output per person employed rose 1.9 per cent.

In the manufacturing sector, output declined in 1970 by seven-tenths of one per cent while the number of persons employed fell by 1.4 per cent and man-hours worked by 2.0 per cent. Output per person employed rose eight-tenths of one per cent and output per man-hour increased by 1.3 per cent. In the services sector, total output for commercial services-producing industries rose 4.0 per cent in 1970 while employment increased 3.0 per cent and man-hours worked by 1.5 per cent. Output per person employed showed a 1.0 per cent increase and output per man-hour rose 2.5 per cent. In the agricultural sector total output declined by 5.3 per cent, the number of persons employed fell by 4.5 per cent and man-hours worked by 5.5 per cent. Output per man-hour in agriculture showed a 6.2 per cent gain, compared with a gain of 9.3 per cent last year. The five-year average annual gain in 1965-1969 was 1.6 per cent.

While still leaving room for improvement, Canada's productivity performance last year was better than that of the United States. The U.S. private sector showed only a 0.9 per cent gain in output per man-hour. However, Canadian manufacturing fared only slightly better than U.S. manufacturing with the U.S.

sector showing a 1.1 per cent improvement compared with the 1.3 per cent productivity increase in Canada.

## Income Distributions — 1969

In a recent statement on preliminary estimates of income distribution by size in Canada, the Dominion Bureau of Statistics reports that between 1967 and 1969, the average income of families (two or more persons living together and related by blood, marriage or adoption) increased by approximately 17 per cent to \$8,876. The average income of unattached individuals (persons living by themselves or rooming in a household with no relationship to other household members) increased by about 23 per cent to \$4,003 during the same period. However, these increases were partially absorbed by the substantial rise in the consumer price index over the two year period. These income changes are indicated by preliminary analysis of the 1970 survey of consumer finance which sampled some 12,000 households across Canada.

Average incomes in Ontario were highest while those in the Atlantic provinces were lowest in Canada, however average family income in these provinces increased at a slightly faster rate. Units headed by males gained 18 per cent and those headed by females, 11 per cent.

A significant shift in the distribution of incomes is also indicated by the fact that the number of families receiving less than \$5,000 dropped from 29.7 per cent in 1967 to 24.7 per cent in 1969 and those receiving \$10,000 or more increased from 22.6 per cent in 1967 to 33.1 per cent in 1969. A similar shift occurred in the incomes of unattached individuals.

The preliminary estimates also include some analysis of low income families and unattached individuals. Using the low income cut-offs adopted by the Economic Council of Canada in its Fifth Annual Review, and adjusting them for the rise in consumer prices, the estimates indicate that the incidence of low incomes among families dropped from 18.6 per cent in 1967 to 17.3 per cent in 1969 and that of unattached individuals from 39.0 per cent to 35.5 per cent in the same two years.

# Reflation, Retrenchment and Reform: Britain's New Fiscal Policies

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The two budgets presented by Britain's new Conservative Chancellor, Mr. Anthony Barber, in the past year represent a radical reversal of the ousted Labour Government's policies of expanding the public sector while restraining the growth of private consumption, and constitute the beginning of a massive exercise in retrenchment and reform.

Further, while the October budget was broadly neutral in its economic impact, the March 1971 budget is mildly reflationary, particularly when combined with an easing of monetary policy. Bank rate was reduced from 7 to 6 per cent on April 1 to stem a very large (and, for the most part, unwanted) inflow of dollars and a new monetary philosophy is emerging with a shift from the existing system of ceilings and guidelines for bank advances to a broader liquidity ratio control. An easing of overseas investment restraints has also begun.

## RETRENCHMENT

A fundamental review of the role of government and of public authorities has been launched with the objects of concentrating and reducing their activities, revising arrangements which have been overtaken by social and economic progress, and releasing manpower for more productive work in the private sector. This means not only less intervention in and less financial assistance to agriculture and industry but also a considerably more selective approach in the provision of social services. It also means hiving off certain activities from government to private enterprise.

Possibly more important, however, is the package of immediate and prospective tax reform which is intended to both reduce and simplify taxation. The Chancellor's recent statements have the great merit of disclosing fiscal plans for several years ahead. This gives business the opportunity to plan ahead and create much-needed confidence.

## REFORM AIMS

The Chancellor's reform aims are:

*First*, to reduce the excessive burden of taxation.

*Second*, to simplify the system, to reduce the number of taxes and to make them more intelligible and easier to work.

*Third*, to encourage initiative, enterprise and effort.

*Fourth*, to encourage people to save more by reducing fiscal penalties on savings.

## Tax reductions

Taking both the October and March budgets together, the tax reductions enacted and proposed comprise:

### (a) Business taxes

- selective employment tax (a tax on the use of labour in service industries) halved;
- corporation tax cut from 45 per cent to 40;
- new system of depreciation allowances replacing investment grants, enabling 60 per cent of expenditure on new or secondhand plant and machinery to be written off in the year in which the expenditure is incurred and 25 per cent of the reducing balance to be written off successively in later years;
- free depreciation for ships and for capital expenditure on new machinery and plant (other than mobile equipment) for use for industrial purposes in development areas;

### (b) Taxes on personal income

- income tax on earned income (wages, salaries, profits, etc.) reduced from 32.5 per cent to 30;
- top rate of combined income tax and surtax (a graduated tax on high incomes) reduced from 91.25 per cent to 75.4 on earned income;
- substantial cuts for parents (who also get higher family allowances);
- higher pension contribution limits for those not in pensionable employment;
- higher income limits for dependent relative deductions;
- higher exemptions for old people (who will also get higher pensions);
- option for working wives to have their earnings taxed as if they were single instead of having these earnings treated as the husband's income for surtax purposes;
- higher limits for certain forms of saving exempt from income tax;
- the higher rate of tax on investment income to be abolished where the amount is small;
- investment income of young children generally no longer to be taxed as income of parent;

- child's investment income derived from parent no longer to be treated as parents' income if child over 18;

### (c) Taxes on capital

- exemption limit for capital gains raised, eliminating liability for a quarter of those previously taxable;
- deemed realization of capital gains (on death or in hands of discretionary trust) abolished;
- estate duty exemption raised, reducing the number of dutiable estates by nearly a quarter;
- payment of death duties on unincorporated businesses and on unquoted shares to be spread over eight years;

### (d) Other taxes

- stamp duty on mortgages abolished

## Tax simplification

The measures to simplify the tax system reduce the number of taxes and to make them more intelligible and easier to work. They comprise:

- replacement of purchase tax and selective employment tax by a value-added tax from 1973;
- merger of income tax and surtax in 1973;
- conversion of income tax deductions from wages and salaries from cumulative to non-cumulative basis (under study);
- statement of basic tax as tax on earned income with surcharge on investment income, instead of taxing investment income at the "standard rate" and applying "earned income relief" to 95 per cent of incomes;
- restriction of attribution of income to head of family where income actually received by wife or child;
- distinction between short-term and long-term capital gains abolished;
- deemed realization of capital gains abolished;
- higher retentions of "close" (closely-held) company profits permitted before inclusion of personal tax on deemed distributions.

## Work incentives

The measures to encourage initiative, enterprise and effort comprise:

- lower rate of corporation tax;
- lower rate of income tax;
- drastic cut in surtax on earned income



### giving incentives

measures to encourage people to save by reducing the fiscal penalties on savings comprise:

- lower rate on short-term capital gains;
- reduced taxation of capital at death;
- higher limits on tax-free forms of saving;
- abolition of stamp duty on mortgages;
- reform of corporation tax to increase after-tax shareholder income.

### CORPORATION TAX REFORM

The Government intends to reform the structure of corporation tax so as to remove the discrimination against distributed profits which exists under the present "classic" system of completely separating corporation and shareholder taxation. This discrimination is said to distort the working of market forces and so tend toward the misallocation of scarce investment resources.

Of the various possible systems of company tax which would achieve this end, the Government considers that the one which would be most appropriate on domestic grounds would be the system adopted by Germany and usually referred to as the two-rate system.

Under a two-rate system, distributed profits would be liable to corporation tax at a lower rate than undistributed profits. In addition, distributed profits would be paid under deduction of income tax and this tax would, as at present, be paid over to the Revenue and would be an advance payment of the shareholder's own eventual tax liability.

The two-rate system maintains a firm line of demarcation between the corporation tax liability of the company and the income tax liability of the shareholder. The Government regards this demarcation as an advantage and

as likely to lead to greater simplicity in the administration of the tax. At the same time, it substantially avoids the double taxation of distributed profits — the feature of the existing system which has tended to divorce the interests of the company and the shareholder.

The Government will also consider a change to an "imputation" (tax credit) system under which all corporate profits bear the same rate of tax but part of this tax can be set against the shareholder's tax liability if the profits are distributed. This is the French system.

Either of these methods should facilitate the flow of funds to those sectors which can use them most profitably.

Britain will not revert to the pre-1965 type of integration which would discriminate against British-based international companies by not permitting repayment of foreign tax to U.K. shareholders.

# Price Changes 1961-1970: An Economic Analysis

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## SUMMARY

Marked upward movements in prices began in 1966 and have generally accelerated since that time. During 1969 the Canadian Consumer Price Index increased by 4.5 per cent; the Wholesale Price Index by 4.6 per cent and the National Accounts Implicit Price Index by 4.7 per cent. Over the course of 1970 price rises have moderated as compared with 1969.

Price increases since 1964 have been significantly higher than 2.0 per cent per annum — a goal suggested by the Economic Council of Canada.

A significant proportion of the rise in prices since 1961 as measured by the Implicit Price Index is attributable to increases in the residential construction and government expenditure sections. Personal expenditure, machinery and equipment, as well as prices of exports and imports all increased at a rate less than that for the Implicit Price Index as a whole during the period 1961 to 1970.

Price performance in Canada compares favourably with that of most of our major trading partners. Although Canadian prices over the period 1961-1970 rose by more than prices in the United States, during the past two years the American Consumer Price Index rose more rapidly than that in Canada. For the first nine months of 1970, U.S. consumer prices increased by 6.0 per cent while Canadian prices rose by 3.8 per cent as compared with the same period in 1969.

Price increases have not been uniform across Canada. Slow growth areas, in spite of high unemployment levels, experienced higher price increases than in Ontario.

The traditional concept that higher levels of unemployment will lead to greater price stability may prove to be socially unacceptable. Results of this study suggest that during the course of the past few years, significantly higher rates of unemployment have occurred before reasonable price stability was attained. In the current economic environment, the extent of regional unemployment which would result from stern anti-inflationary measures could be in the order of 10 per cent.

The rapid rise in U.S. prices and a parallel but generally greater price increase in Canada during the period 1961-1970 suggest that Canadian price increases are linked to changes in American price levels.

Although selective tax and other policies to curtail price increases have been advocated by the federal government, recognition should be given to the fact that:

- price increases in Ontario have been smaller than in other provinces and regions of Canada;
- prices in the export sector (which is important in the Ontario economy) have not increased as rapidly as either the Consumer Price Index or the Implicit Price Index;
- investment in production facilities should not be discouraged since these lead to improved productivity and hence to better price performance.

Prices have an important allocative function in our economy in that they signal both shortages and surpluses. If artificial restraints hinder price and wage changes for other than very short periods, serious long-run distortions may result in the allocation of the factors of production.

## INTRODUCTION

There are in Canada three broad indexes which measure price movements. The best known and most often used is the Consumer Price Index. The two other important indexes are the Wholesale Price Index and the Implicit Price Index. The latter is used in national accounts data. While each of these indexes is not a fully satisfactory measure of price movements, it is generally agreed that they do provide a good indication of price changes over time.

Table 1 shows that the Consumer Index for Canada exhibited a sharp up movement beginning in about 1966. Prior to that time the annual percentage change in the Consumer Price Index was 2.5 per cent or less. In 1966 prices rose by 3.7 per cent, declined slightly in the following year, and rose again in 1968 by just over 4 per cent. During the course of 1969 the index continued to exhibit a strong upward movement, and the change over the previous year was 4.5 per cent. Price increases began to moderate in 1970 and the annual rise in consumer prices declined to 3.3 per cent.

The table also indicates that over the period 1961-1970 the Implicit Price Index increased by 32.7 per cent as compared with the Consumer Price Index which rose 29.7 per cent. Although the Wholesale Price Index lagged slightly behind, it increased in the same period by 22.8 per cent.

Much of the recent debate and discussion relating to price increases and the appropriate policies to alleviate them, has been concerned with the extent to which Ontario was a contributor to upward price movement. It has been suggested that selective policies must be adopted to curtail price increases in Ontario, while at the same time ensuring that slower growing regions in Canada are held back. The following sections discuss the nature and forces underlying the price changes which have been referred to, as well as examining some of the policy implications for Ontario which stem from these characteristics.

**Table 1 — Index of Consumer Prices, Wholesale Prices and Implicit Prices, Canada, 1961-1970 (1961 = 100)**

	CPI		WPI		IPI	
	Index	Annual % Change	Index	Annual % Change	Index	Annual % Change
1961	100.0	—	100.0	—	100.0	—
1962	101.2	1.2	102.9	2.9	101.4	1.4
1963	103.0	1.8	104.8	1.8	103.3	1.9
1964	104.8	1.7	105.2	0.4	105.8	2.4
1965	107.4	2.5	107.3	2.0	109.5	3.5
1966	111.4	3.7	111.2	3.6	114.5	4.6
1967	115.4	3.6	113.2	1.8	118.4	3.4
1968	120.1	4.1	115.7	2.2	122.6	3.5
1969	125.5	4.5	121.0	4.6	128.4	4.7
1970	129.7	3.3	122.8	1.5	132.7 <sup>1</sup>	3.8

<sup>1</sup>First three quarters of 1970.

Source: DBS, Prices and Price Indexes.

DBS, National Income and Expenditure Accounts, 1926-1968.



## Definition and Theories of Inflation

Although there are many definitions of inflation, one of the most succinct and useful is one which states that inflation occurs when money incomes outstrip the sustainable rate of growth. Perhaps a more encompassing definition is one which suggests that inflation is a process resulting from competition in attempting to maintain total real income, total real expenditure, and/or total output at a level which has become physically impossible.

A review of the recent literature which analyzes various theories of inflation suggests that the traditional approach of labelling inflation as either demand-pull or cost-push is misleading. Much of the current theoretical investigation into the nature and causes of inflation suggests that earlier approaches are simplistic. Indeed, depending on the period selected, almost any theory of inflation can be propounded. Unfortunately, for the policymaker, it is essential to grasp the nature and significance of each particular type if policy prescriptions are not to be for the wrong disease.

For the purposes of clarity, brief descriptions of various types of inflations are given: *Demand-pull theory* — assumes prices rise in response to an increase in aggregate demand. *Cost-push theory* — assumes that inflation is caused by various factors of production trying to increase their relative share of total product by raising prices.

*Monetary and structural theory* — assumes that structural or institutional rigidities pre-

vent a quick response to changes in demand. That is, labour or capital immobility prevents the smooth reallocation of resources to meet changing demand needs.

Some economists have suggested that an indication of the type of inflation prevalent at any given time can be determined from examining the changing distribution of national income to various groups in society.

Table 2 shows the distribution of net national income at factor cost. The average proportion of net national income at factor cost during the period 1961 to 1969 for each of the various groups is as follows: wages, salaries and supplementary income 69.6 per cent; corporation profits before taxes (less dividends paid to non-residents) 12.8 per cent; net income of non-farm unincorporated business including rents 8.4 per cent; and other 9.2 per cent.

On the basis of these averages, it is seen that prior to 1967 wages, salaries and supplementary labour income as a percentage of national income were lower as a proportion of the total than the nine-year average. Since 1967 there has been an upward movement in this proportion, and for the most recent full year period in which data is available, this component accounted for 72.2 per cent of the total net national income. Profits, as a proportion of net national income at factor cost, during these last three years have been lower than their nine-year average. The same has been true for the proportion of net national income at factor cost going to non-farm unincorporated business.

The evidence in Table 2, while not conclusive, tends to suggest that in the aggregate those receiving wages, salaries and supplementary labour income have improved their share of net national income and that this has been at the "expense" of all other incomes.<sup>1</sup>

## Sectoral Analysis

The Implicit Price Index provides one of the best indicators of price movements by sector. Unfortunately, this series is available only on a national basis. In Table 3 it can be seen that during 1969 and 1970 government expenditures, non-residential construction and residential construction contributed to upward price movements. In each of the full years shown in the table, except 1968, prices in the residential construction sector moved upward at substantially higher rates than did the index as a whole. The same is true without exception for government expenditure.

The most moderate price behaviour in recent years has taken place in the machinery and equipment sector. Exports have also tended toward moderate upward price movements. Both of these sections are important in the Ontario economy and their past price performance should be taken into account in arriving at appropriate long-run, anti-inflationary policies.

Table 4 shows that prices of domestic exports have not increased as rapidly as either the Consumer Price Index or the Implicit Price Index. Import prices have increased at somewhat slower rates relative to exports. Moreover, import prices have

Table 2 — Percentage Distribution of Net National Income at Factor Cost, Canada, 1961-1970<sup>1</sup>

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Wages, salaries and supplementary labour income	69.3	68.2	67.6	67.8	68.8	69.3	71.6	71.5	72.2	73.5
Corp. profits before taxes — less dividends paid to non-residents	11.9	12.6	13.0	14.1	14.1	13.2	12.0	12.2	11.7	10.5
Net income of non-farm unincorporated business including rents	9.6	8.8	9.0	8.6	8.4	7.9	8.0	7.8	7.4	7.1
Other	9.2	10.3	10.4	9.4	8.8	9.6	8.4	8.5	8.8	8.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup> Last three quarters of 1970.

Note: Data may not add to 100 because of rounding.

Source: DBS, National Income and Expenditure Accounts, 1926-1968.

DBS, National Income and Expenditure Accounts.

<sup>1</sup>A different view is expressed in an Organisation for Economic Co-operation and Development report (Economic Outlook, Dec. 1970) which suggests that wage rates have lagged behind increases in production and profits by some

three years and that the recent acceleration in pay rates constitutes "catching up". Table 2 which examines changes in the distribution of net national income at factor cost, does not support such a conclusion.

**Table 3 — Implicit Price Indexes, Canada, 1961-1970 (1961 = 100)**

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Personal expenditure	100.0	101.4	103.0	104.3	106.5	110.0	113.7	118.1	122.9	125.1
Government expenditure	100.0	102.6	106.3	110.1	116.6	124.3	132.9	142.4	154.9	161.2
Business gross fixed capital formation	100.0	101.4	103.7	106.7	111.5	116.8	118.2	119.5	125.1	128.4
Residential construction	100.0	100.0	102.2	106.9	112.3	119.2	126.6	129.2	136.0	140.1
Non-residential construction	100.0	100.9	103.1	104.3	110.4	117.6	118.2	120.1	127.7	130.4
Machinery and equipment	100.0	103.0	105.3	108.9	112.1	114.9	114.2	113.6	116.5	118.4
Exports	100.0	103.2	104.5	106.9	108.5	111.7	113.7	115.3	118.0	120.1
Imports	100.0	104.4	106.2	107.4	107.6	109.4	111.6	113.6	116.8	118.4
G.N.E.	100.0	101.4	103.3	105.8	109.5	114.5	118.4	122.6	128.4	131.2

**Implicit Price Indexes, Annual Percentage Change**

	1962/61	1963/62	1964/63	1965/64	1966/65	1967/66	1968/67	1969/68	1970/69
Personal expenditure	1.4	1.6	1.3	2.1	3.3	3.4	3.9	4.1	3.5
Government expenditure	2.6	3.6	3.6	5.9	6.6	6.9	7.1	8.8	5.1
Business gross fixed capital formation	1.4	2.3	2.9	4.5	4.8	1.2	1.1	4.7	3.0
Residential construction	—	2.2	4.6	5.1	6.1	6.2	2.1	5.3	2.4
Non-residential construction	0.9	2.2	1.2	5.8	6.5	0.5	1.6	6.3	4.4
Machinery and equipment	3.0	2.2	3.4	2.9	2.5	-0.6	-0.5	2.6	2.7
Exports	3.2	1.3	2.3	1.5	2.9	1.8	1.4	2.3	1.0
Imports	4.4	1.7	1.1	0.2	1.7	2.0	1.8	2.8	2.7
G.N.E.	1.4	1.9	2.4	3.5	4.6	3.4	3.5	4.7	3.8

<sup>1</sup>First three quarters of 1970.<sup>2</sup>First three quarters of 1970 over first three quarters of 1969.

Source: DBS, National Income and Expenditure Accounts, 1926-1968.

**Table 4 — Price Index Numbers of Domestic Exports and Imports, Canada, 1961-1970 (1961 = 100)**

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Domestic exports										
Live animals	100.0	109.9	107.7	107.8	97.2	110.6	124.0	133.3	152.1	158.4
Food, feed, beverages and tobacco	100.0	105.4	105.1	106.0	107.8	113.8	114.9	114.1	116.4	118.1
Crude materials, inedible	100.0	104.7	106.4	107.2	111.3	116.3	118.0	122.8	128.4	130.4
Fabricated materials, inedible	100.0	101.2	102.0	103.8	105.2	108.6	110.6	116.5	123.3	125.4
End products, inedible	100.0	102.7	103.8	105.6	107.3	110.0	112.9	117.0	120.2	122.4
Total	100.0	103.3	104.0	105.4	106.8	111.2	113.4	117.4	122.6	125.4
Imports										
Live animals	100.0	111.7	111.7	101.0	107.7	121.5	121.5	128.4	137.2	140.1
Food, feed, beverages and tobacco	100.0	103.6	130.3	128.9	107.9	105.7	102.7	106.3	109.4	112.1
Crude materials, inedible	100.0	104.3	106.5	107.7	110.9	113.8	113.1	114.9	119.5	121.4
Fabricated materials, inedible	100.0	103.7	105.9	107.8	110.1	110.4	111.2	111.9	116.9	118.4
End products, inedible	100.0	105.7	106.7	108.0	109.3	111.5	114.5	117.0	120.1	122.4
Total	100.0	104.5	108.6	109.8	109.8	111.3	112.1	113.9	118.1	120.1

<sup>1</sup>First 9 months of 1970.

Note: Index converted from 1948 = 100 base.

Source: DBS, Trade of Canada — Vol. I, Summary and Analytical Tables.  
DBS, Summaries of Foreign Trade, Exports and Imports.



increased by less than the Consumer Price Index. This relationship suggests that imports have tended to restrain domestic price inflation. Thus, tariff changes or the prospect of tariff changes may be an important policy tool in moderating Canadian price levels.

### Regional Price Movements

Although regional data similar to that shown in Table 3 is not available, some indication of price movements across Canada may be observed in Table 5. Unfortunately, direct inter-city comparisons cannot be made because the weighting system for each city is representative of consumption patterns of families in that area alone.

Given this limitation, the annual percentage changes in prices shown in Table 5 do suggest that sharp price increases during the last four years have not been limited to large cities alone nor confined to particular provinces.

### Canadian Price Movements in the International Context

The extent to which Canada is an "open economy" as compared with, say, the United States, is well known. For example, the im-

portance of exports in the total Canadian economy is markedly greater than in a number of other countries. This suggests that policy makers in Canada should give cognizance to external price movements and Canada's price performance relative to them. In view of the long-term secular growth of prices, not only in Canada but in all industrialized countries, marked deviations in price performance from those prevailing in countries with whom we trade may be both unnecessary and undesirable given the social cost which may be incurred.

Data published by the Organisation for Economic Co-Operation and Development in Table 6 shows that from the period beginning in 1961 to the end of the second quarter of 1970, Canadian price performance was better than that of most OECD countries. Only the United States and Germany had a lower rate of price change.

Table 7 compares price movements between Canada and the United States over the period 1961 to 1970. For each of the three price series over the full period 1961-1969, Canadian price performance has been poorer than in the United States.

While the total change in the Consumer

Price Index between 1961 and 1969 was not much greater in Canada — an increase of 25.5 per cent as compared to an increase of 22.6 per cent in the U.S., the Implicit Price Index and the Wholesale Price Index series showed marked variation between the two countries. The U.S. Wholesale Price Index increased by 12.7 per cent between 1961 and 1969 — almost one-half the Canadian increase of 21.0 per cent. Although the Canada-U.S. difference for the Implicit Price Index was not as great, the Canadian index was some six percentage points higher over the reference period.

During the last two years changes in Canadian price levels compare much more favourably with changes in the U.S. Table 7 shows that in 1968 all price indexes in Canada increased by less than the same series in the United States. The data also shows that during 1969 and 1970 prices in the United States moved upward faster than in Canada. The U.S. Consumer Price Index for the first nine months of 1970 rose by 6.0 per cent as compared with 3.8 per cent in Canada. The rate of increase in the Canadian Wholesale Price Index was about one-half that in the U.S. during the first nine

Table 5 — Consumer Price Index, Canada and Regional Cities, 1961-1970 (1961 = 100)

#### ALL ITEMS

	Canada	St. John's Nfld.	Halifax	Saint John	Montreal	Ottawa	Toronto	Winnipeg	Saskatoon Regina	Edmonton Calgary	Vancouver
1/61	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2/61	101.2	100.8	101.3	100.9	101.2	101.2	100.9	101.3	101.7	101.0	100.3
3/61	103.0	102.8	102.3	102.5	102.9	102.9	102.6	102.2	102.5	102.1	101.9
4/61	104.8	103.9	102.7	103.5	104.5	104.5	104.3	103.8	103.5	102.6	102.6
5/61	107.4	105.5	104.6	105.1	106.7	106.3	106.9	106.1	105.2	104.1	104.5
6/61	111.4	108.0	107.4	107.8	109.9	110.4	111.6	109.3	108.3	107.5	107.0
7/61	115.4	110.9	109.9	111.1	114.2	113.1	114.9	113.3	111.3	111.8	111.0
8/61	120.1	115.9	114.2	115.1	118.1	118.4	119.3	118.2	115.8	116.7	115.1
9/61	125.5	119.3	119.5	119.8	121.8	123.1	124.1	123.1	119.7	121.5	119.0
10/61	129.7	121.6	124.4	123.5	124.3	127.4	127.3	127.0	122.2	125.1	123.0
<b>Annual Percentage Change</b>											
2/61	1.2	0.8	1.3	0.9	1.2	1.2	0.9	1.3	1.7	1.0	0.3
3/62	1.8	2.0	1.0	1.6	1.7	1.7	1.7	0.9	0.8	1.1	1.6
4/63	1.7	1.1	0.4	1.0	1.6	1.6	1.7	1.6	1.0	0.5	0.7
5/64	2.5	1.5	1.9	1.5	2.1	1.7	2.5	2.2	1.6	1.5	1.9
5/65	3.7	2.4	2.7	2.6	3.0	3.9	4.4	3.0	2.9	3.3	2.4
7/66	3.6	2.7	2.3	3.1	3.9	2.4	3.0	3.7	2.8	4.0	3.7
8/67	4.1	4.5	3.9	3.6	3.4	4.7	3.8	4.3	4.0	4.4	3.7
9/68	4.5	2.9	4.6	4.1	3.1	4.0	4.0	4.1	3.4	4.1	3.4
10/69	3.3	1.9	4.1	3.1	2.1	3.5	2.6	3.2	2.1	3.0	3.4

Source: DBS, Prices and Prices Indexes.

**Table 6 – Consumer Price Index, Selected OECD Countries, 1969 and 1970 (1961 = 100)**

	1969	1970 <sup>1</sup>	Percentage Change			
			1969			1970
			2Q/1Q	3Q/2Q	4Q/3Q	2Q/1Q
United States	122.4	128.6	1.8	1.4	1.4	1.6
Germany	123.4	127.7	0.4	0.1	0.9	0.8
Canada	125.8	129.9	1.8	1.2	0.7	0.8
Belgium	127.8	132.0	0.8	0.8	1.6	0.8
Switzerland	131.2	134.4	0.8	—	0.8	0.8
Austria	132.3	136.6	0.8	0.8	0.8	0.8
United Kingdom	135.1	143.6	1.6	0.2	1.3	2.3
Sweden	135.5	144.1	0.8	0.8	0.8	1.5
France	136.3	142.9	1.3	1.1	1.5	0.8
Italy	137.1	142.7	1.0	1.2	1.0	1.6
Netherlands	142.1	147.4	1.6	—0.3	0.9	1.4
Japan	154.0	164.4	1.8	2.3	1.3	1.4

<sup>1</sup>Second quarter of 1970.

Source: OECD Main Economic Indicators.

**Table 7 – Consumer, Wholesale and Implicit Price Indexes  
Canada and United States, Annual Percentage Changes, 1961-1970**

	CPI		WPI		IPI	
	Canada	U.S.	Canada	U.S.	Canada	U.S.
1962/61	1.2	1.2	2.9	0.3	1.4	1.1
1963/62	1.8	1.2	1.8	—0.3	1.9	1.4
1964/63	1.7	1.3	0.4	0.2	2.4	1.5
1965/64	2.5	1.7	2.0	2.0	3.5	1.9
1966/65	3.7	2.8	3.6	3.3	4.6	2.7
1967/66	3.6	2.9	1.8	0.2	3.4	3.2
1968/67	4.1	4.2	2.2	2.6	3.5	4.0
1969/68	4.5	5.4	4.6	3.9	4.7	4.8
1970/69	3.8 <sup>1</sup>	6.0 <sup>1</sup>	2.0 <sup>1</sup>	4.0 <sup>1</sup>	3.8 <sup>2</sup>	5.3 <sup>2</sup>
1969/61	25.5	22.6	21.0	12.7	28.4	22.5

<sup>1</sup>First nine months of 1970 over first nine months of 1969.<sup>2</sup>First three quarters of 1970 over first three quarters of 1969.

Source: DBS, Prices and Price Indexes.

DBS, National Income and Expenditure Accounts, 1926-1968.

U.S. Economic Indicators and Department of Commerce Survey of Current Business.

months of 1970, while the U.S. increase in the Implicit Price Index for the first three-quarters of 1970 was 1.5 percentage points higher than in Canada.

### Price Changes, Interest Rates, and the Money Supply

During the course of the past year, attention was focused on the movement of interest rates and their relationship to price changes.

Table 8 shows the relationship between the Consumer Price Index, the yield on federal government bonds and interest on conventional mortgages.

The table shows that between 1961 and 1965 the Consumer Price Index increased more rapidly than did yields on federal government bonds or interest rates for conventional mortgages. After 1965 both the yield on federal government bonds and the rate of

interest for conventional mortgages began move sharply upward. By the following year the yield index of federal government bonds was higher than the Consumer Price Index. After 1967 both the yield on federal government bonds and interest on conventional mortgages moved upward at accelerating rates, so that the Consumer Price Index was outpaced in 1968, 1969, as well as during 1970.

**Table 8 – Consumer Price Index, Bond Yields and Mortgage Interest Rates, Canada, 1961-1970 (1961 = 100)**

	Consumer Price Index	Federal Government Bonds	Conventional Mortgage
1961	100.0	100.0	100.0
1962	101.2	101.2	99.6
1963	103.0	100.8	99.6
1964	104.8	102.6	99.6
1965	107.4	103.2	100.3
1966	111.4	112.7	109.4
1967	115.4	117.6	115.3
1968	120.1	133.7	129.6
1969	125.5	150.1	140.6
1970	129.7	156.6	149.3

Source: DBS, Prices and Price Indexes.

Canadian Housing Statistics.

Bank of Canada Statistical Summary.

It should be emphasized that while recent annual rates of change for federal government bond yields and interest on conventional mortgages have been substantially greater than for the Consumer Price Index, the absolute differences between bond yields, interest rates and annual changes in the CPI have been narrowing. In 1961 the yield on long-term federal government bonds was 5.05 per cent. If the rate of change in 1961 of the Consumer Price Index is subtracted from the yield on federal government bonds, then the "net" yield was 4.15 per cent. In spite of rising yields on federal government bonds, the net yield after subtracting changes in the Consumer Price Index has, until very recently, declined. For example, even though the yield on federal government bonds in 1969 was 7.58 per cent, the net yield after subtracting price changes in that year was 3.08 per cent. In 1970 the net yield on federal government bonds rose to 4.61 per cent.



Much the same pattern is evident with respect to conventional mortgages until very recently when "net" yields increased. In 1961 the conventional mortgage rate was 7 per cent. After subtracting changes in the Consumer Price Index for that year, the "net" yield was 6.0 per cent. Conventional mortgage rates for 1970 averaged 10.45 per cent; the net yield, calculated in the way described above, was 7.15 per cent.

Investor recognition of these past trends has done much to dampen the flow of funds into long-term bonds and mortgages. In recent months, however, the relationship between some interest rates and rates of change in prices has become more favourable.

### Prices, Productivity, and Labour Income

Examining the nature of recent price movements, it should be remembered that prices in our economic system are signals. It is to be expected that where genuine shortages or bottlenecks occur, prices will ration the allocation of resources. Unfortunately, the scarcity aspect as measured by price increases cannot be directly derived from any price indexes. Given this phenomenon, care must be taken to ensure that prices, wages and other incomes continue to reflect real demand situations. For example, if prices and wages are slow to respond to excess capacity and unemployment, then increasing demand will not halt inflation. It will only lead to greater unemployment. In our present North American economic environment, prices and wages may still rise some months as a result of past growth in unemployment and excess capacity increases.

Price and wage indexes indicate a general upward inflexibility. This suggests that if demands in the aggregate are not excessive, increases in price levels will still occur thereby creating a situation wherein rising prices do in fact indicate shortages. In recent months attention has been focused on the relationship between output per person employed and labour income per employee. It has been suggested that one of the causes of our current inflationary experience has been the fact that labour income per employee has outpaced output per person employed.

Table 9 below shows that in both Canada and the United States output per person employed, using 1961 = 100 as a base, has risen faster than labour income per employee during the period 1961 to the third quarter of

1970. The trend in Canada suggests that the earlier gap between the two indexes has narrowed considerably. The same comparison for the United States indicates that the rate of increase in labour income per employee has not been as great as output per person employed.

**Table 9 – Index of Output per Person Employed and Labour Income per Employee, Canada and United States, 1961-1970 (1961 = 100)**

	Output per Person Employed		Labour Income per Employee	
	Canada	U.S.	Canada	U.S.
1961	100.0	100.0	100.0	100.0
1962	105.4	106.2	103.1	104.0
1963	110.5	110.2	106.8	107.6
1964	116.7	115.3	111.4	112.1
1965	124.0	121.8	118.0	116.0
1966	133.1	130.0	126.8	121.6
1967	138.0	134.9	135.8	126.6
1968	146.8	144.0	144.6	135.0
1969	156.4	151.1	154.2	143.3
1970 <sup>1</sup>	164.0	156.2	162.5	150.8

<sup>1</sup>First three quarters of 1970.

Source: DBS, National Income and Expenditure Accounts, 1926-1968.

DBS, Labour Force Survey.

DBS, Estimates of Employees by Province and Industry.

U.S. Department of Labour, Handbook of Labour Statistics, 1969.

U.S. Department of Labour, Monthly Labour Review.

U.S. Department of Commerce, Survey of Current Business.

### Inflation and Unemployment

The relationship between unemployment and inflation is of prime importance. Much of the discussion regarding policy alternatives and trade-offs has centered around the Phillips curve<sup>2</sup> which purports to show the relationship between hourly earnings, average price rises (or some similar indicator) and unemployment.

Figure 1 on page 10 plots annual implicit price changes on the vertical axis against annual average unemployment rates shown on the horizontal axis for both Ontario and Canada on an annual basis from 1961 to the third quarter of 1970. Two sets of curves for Ontario and Canada have been plotted. The first relates to the period 1961-67, while the

second set, which is above and to the right of the first, relates to the period 1968-1970.

It is significant to note that both sets of curves indicate that the trade-off curve for Canada is to the right and above the curve for Ontario. This suggests that for any given level of price change, the cost in terms of higher unemployment is significantly greater for Canada as a whole than for Ontario. For example, in 1963 for a price change of 1.8 per cent, unemployment was about 3.8 per cent in Ontario and about 5.5 per cent in Canada.

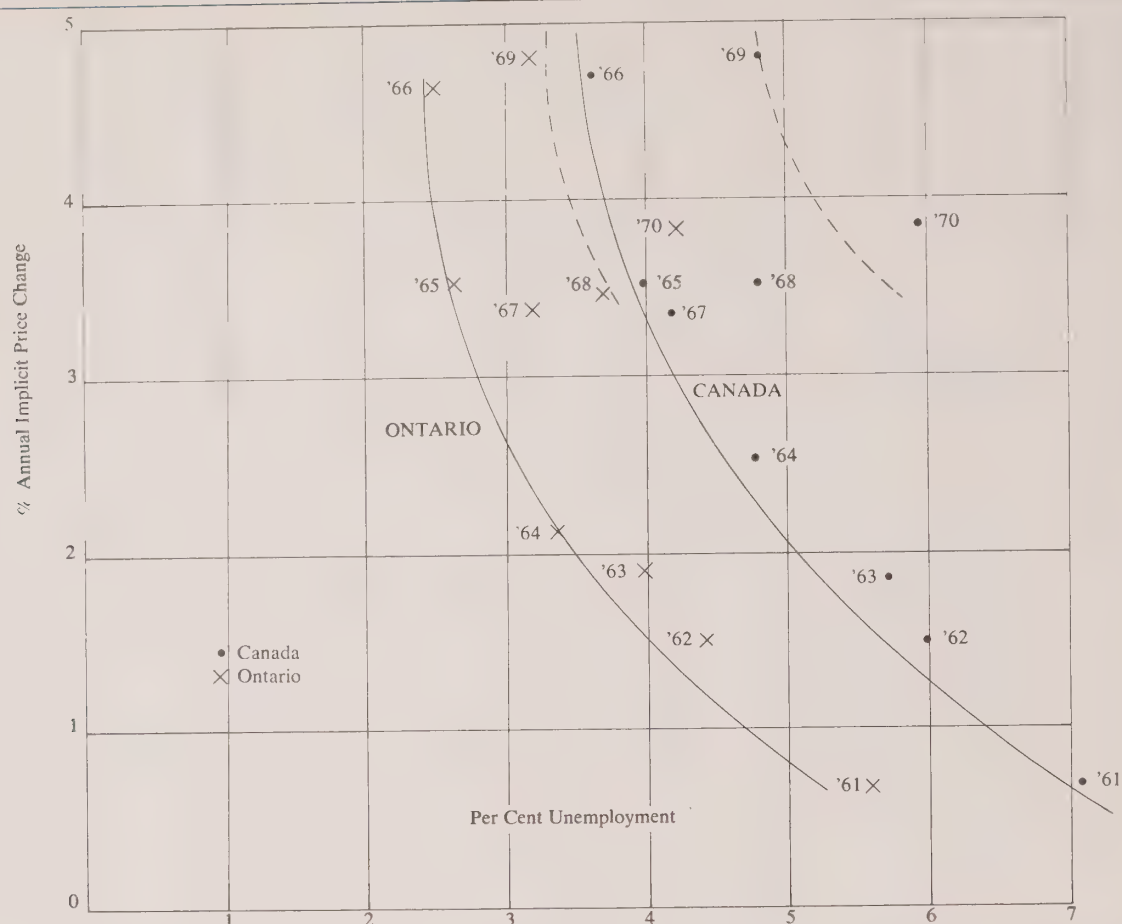
It is not novel to point out the fact that unemployment rates in Ontario have always tended to be markedly lower than those for all of Canada. What is interesting, however, in the present policy context, is that an Ontario Phillips curve shows that much less unemployment has occurred at any given level of price change. Ideally, the data would be more meaningful if some form of implicit price change index were also available for the Ontario economy.

The behaviour of the Phillips curves since 1967 poses some very serious policy problems. While both the curves for Ontario and Canada tended to follow a smooth trade-off relationship between price changes and levels of unemployment up to 1967, from that time forward their performance can best be described as erratic. It appears that both trade-off curves have, in fact, shifted upward and to the right. This is shown by the two shorter curves in Figure 1. This shift has occurred in the region where the implicit price change on an annual basis is equal to or greater than 3.5 per cent. If these relationships persist, the social cost of trade-offs will be excessive. The traditional view that price rises can be tempered by greater unemployment may prove to be unacceptable.

The regional unemployment implications of the Phillips curves are indeed profound. It would appear that the levels of unemployment which slower growing regions of Canada would have to sustain in order to arrive at a moderate increase in the implicit price level would be substantial.

The other policy implication which flows from the Phillips curve is that traditional use of the "big levers" of monetary and fiscal policy may not be appropriate given the behaviour of the Phillips curve during the past few years. The chart suggests that there exist in Canada significant rigidities which impede the movement of resources. These rigidities may affect either capital or labour or both.

<sup>2</sup>Named after A. W. Phillips of the London School of Economics who examined the nature of trade-off relationships.

Figure 1 — Phillips Curve, Ontario and Canada, 1961-1970<sup>1</sup><sup>1</sup>First three quarters of 1970.

Source: DBS, National Income and Expenditure Accounts, 1926-1968.

DBS, Seasonally Adjusted Labour Force Statistics, 1953-1969.

Table 10 — Unemployment Rates and Annual Changes in the Consumer Price Index, Canada and Regions, 1961-1970

	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
	Unem- ployment	C.P.I.	Unem- ployment	C.P.I.	Unem- ployment	C.P.I.	Unem- ployment	C.P.I.	Unem- ployment	C.P.I.	Unem- employment	C.P.I.
1961	7.1	—	11.2	—	9.2	—	5.5	—	4.6	—	8.5	—
1962	5.9	1.2	10.7	1.3	7.5	1.2	4.3	0.9	3.9	1.0	6.6	0.9
1963	5.5	1.8	9.5	1.0	7.5	1.7	3.8	1.7	3.7	1.1	6.4	1.0
1964	4.7	1.7	7.8	0.4	6.4	1.6	3.2	1.7	3.1	0.5	5.3	0.4
1965	3.9	2.5	7.4	1.9	5.4	2.1	2.5	2.5	2.5	1.5	4.2	1.4
1966	3.6	3.7	6.4	2.7	4.7	3.0	2.5	4.4	2.1	3.3	4.5	2.9
1967	4.1	3.6	6.6	2.3	5.3	3.9	3.1	3.0	2.3	4.0	5.1	3.3
1968	4.8	4.1	7.3	3.9	6.5	3.4	3.5	3.8	3.0	4.4	5.9	3.8
1969	4.7	4.5	7.5	4.6	6.9	3.1	3.1	4.0	2.9	4.1	5.0	3.7
1970	5.9	3.3	7.4	4.1	7.9	2.1	4.3	2.6	4.3	3.0	7.7	3.0

Note: Price index for region is based on largest city within the region for which data is published.

Source: DBS, Seasonally Adjusted Labour Force Statistics, 1953-1969.

DBS, Prices and Price Indexes.



either event, special policies beyond the additional monetary and fiscal ones will be required if a better price-unemployment performance is to be achieved.

The average annual rates of regional unemployment and annual changes in the Consumer Price Index for the period 1961 to 1970 are presented in Table 10.

The table documents that the trade-off between reasonable price stability and unemployment has been achieved at a high regional social cost. For example, between 1961 and 1964 when annual increases in the Consumer Price Index were less than 2 per cent, annual unemployment rates in the Atlantic region were 7.8 per cent or higher. During 1961 and 1962 in the Atlantic region the unemployment rates were 11.2 and 10.7 per cent respectively. In Quebec consumer prices were stable from 1961 to 1964 but unemployment rates were significantly higher than Canadian averages. In both the Prairies and British Columbia prices were reasonably stable until 1966. In British Columbia periods of relative price stability were accompanied by high rates of unemployment. Table 10 illustrates that during 1970 higher unemployment in all regions was accompanied by declines in the rate of increase in the Consumer Price Index.

#### Factors Affecting Future Price Movements

In view of the rapidly changing economic environment, the probable course of price movements is very difficult to predict. A number of forces are at work both to restrain future price movements and to accelerate

them. As a result, the outlook for net price movements is somewhat uncertain.

It has been suggested that price movements in the United States tend to be reflected in Canada. This being the case, the success or failure to stem rapidly rising prices in the United States will have a profound influence in Canada. The timing of policies for restraint will be important. Considerable lags are likely to occur before Canadian prices begin to reflect the actions of United States fiscal and monetary authorities.

The rate of price increases in recent months has tended to slow down. Nevertheless, it is still too soon to tell whether the calls for restraint combined with other policy initiatives will bring about reasonable price stability.

Recognition must also be given to two other important domestic factors. Firstly, contract settlements during the past year have been substantial as compared with earlier years. Since many agreements call for wage and other benefit increases in stages over the life of the contract, these cost increases will be reflected for some time to come. Another key variable relates to upcoming contract negotiations. If these contracts should follow the pattern of settlements made during 1969 and 1970 and if, in a number of them, parity with U.S. wage and benefit scales occurs, it is difficult to see how significant price increases can be curtailed during the coming year.

Over the long run, some recognition must also be given to the impact on prices of

pent-up pressures which may be generated by the Prices and Incomes Commission itself. Voluntary restraints may simply blunt immediate price increases while leading to larger increases in the future.

An important factor tempering price growth would be an improvement in productivity. This suggests that policies which discriminate against investments which will add to total output and improve productivity may not be among the best anti-inflationary tools.

Monetary and fiscal policies may not be overly effective in those areas or parts of the country which in fact have exhibited the slowest economic growth and which continue to experience high rates of unemployment. To some extent there exists a policy paradox. If growth and output are effectively restrained in Ontario, total national output will fall and fewer resources will be available for transfer payments and assistance to areas of slower growth.

While there is a lack of consensus as to the type of inflation Canada is currently experiencing, economists agree that whether it is demand-pull or cost-push or some variant of the two, neither type could have been sustained without large and continuing increases in government expenditures combined with large increases in the money supply. Even without undue increases in the money supply the velocity of money circulation is flexible enough to permit price rises. If such is the case, then pure monetary restraint may not be sufficient to arrest the upward movement of prices.

# Selected Economic Indicators

## Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Hours



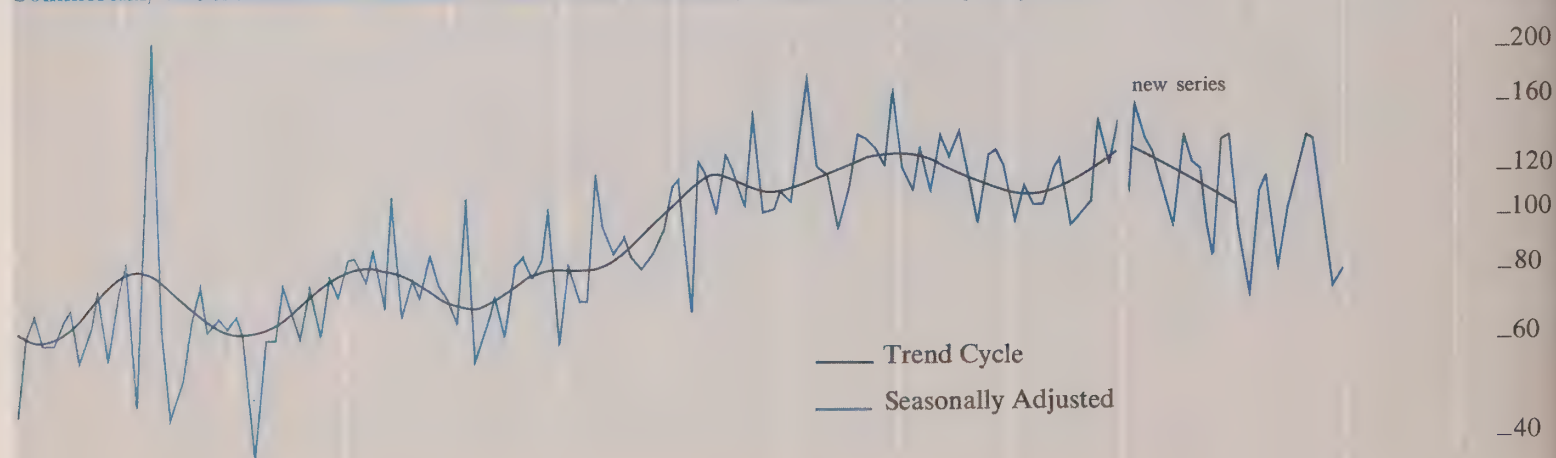
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

\$ Billion



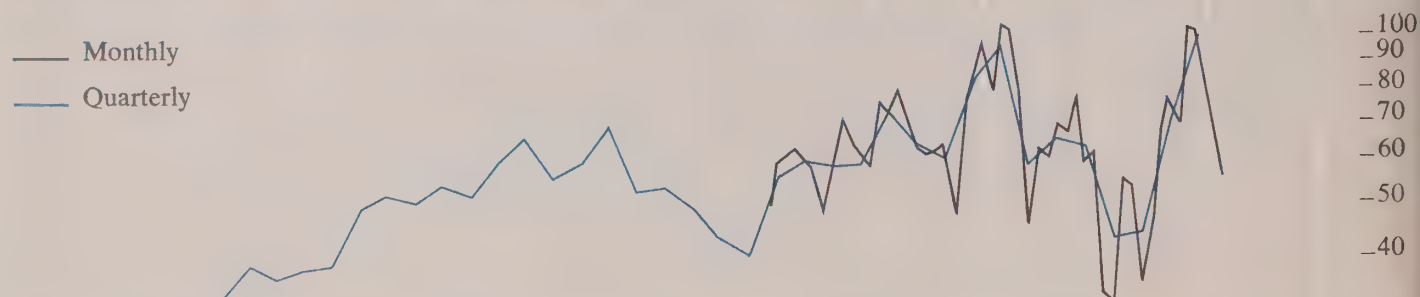
Commercial/Institutional and Industrial Construction Contracts, Ontario (Seasonally Adjusted)

\$ Million



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

Thousands



1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971



## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

\$ Billion  
Scale L1  
\_35  
\_30  
\_25  
\_20  
\_15

**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Index  
Scale L2  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion  
Scale L1  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35

— Current Dollars  
— Constant (1957) Dollars

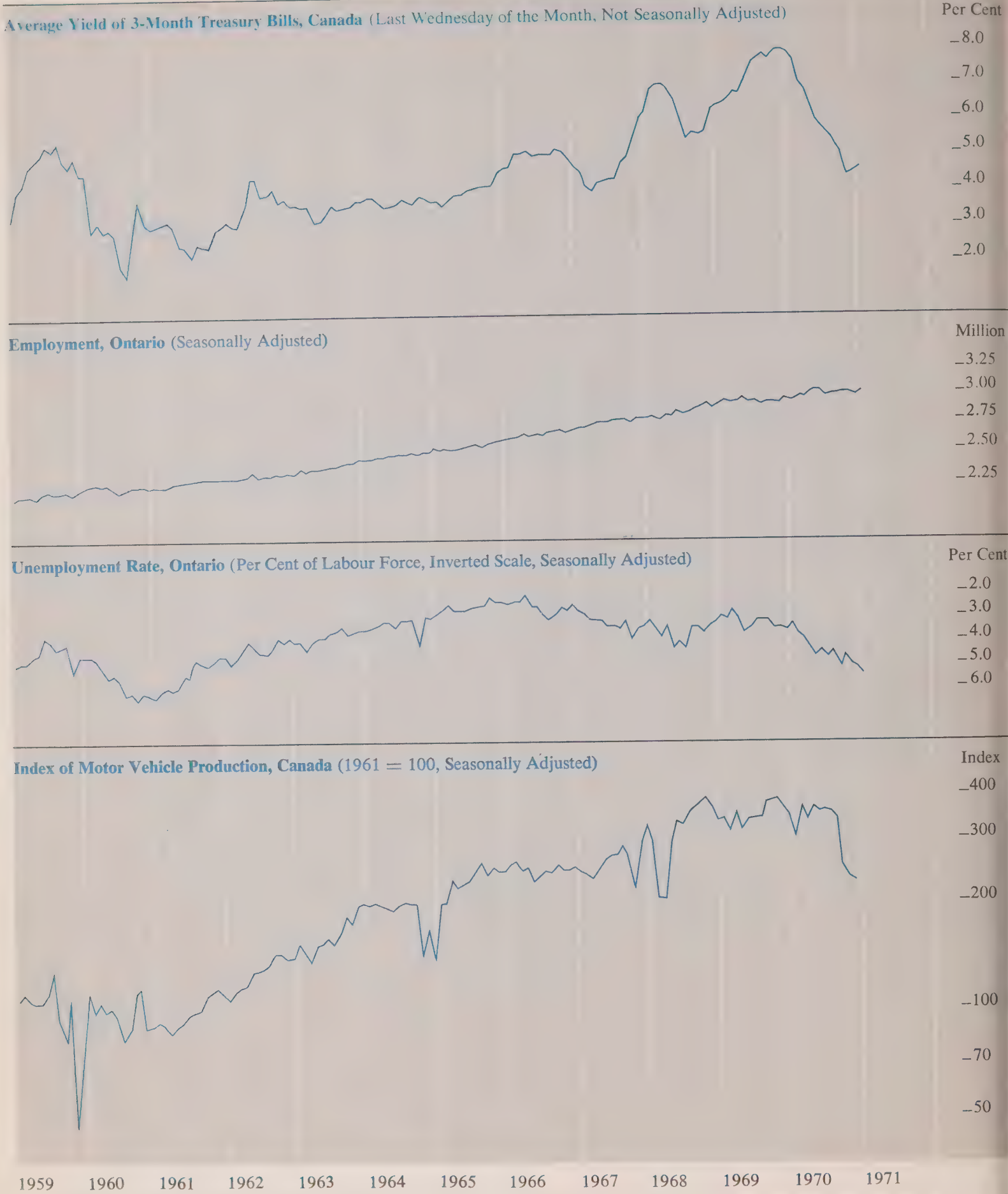
new series  
constant (1961) dollars

**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Dollars  
Scale L1  
\_3.50  
\_3.00  
\_2.50  
\_2.00

1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

# Coincidental and Lagging Indicators





	1970												1971	
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
<b>Leading Indicators</b>														
Average Weekly Hours Worked in Manufacturing	40.0	40.1	39.5	39.8	39.9	40.6	39.5	40.0	39.6	39.5	39.4	40.1	39.8	
New Orders in Manufacturing Industries <sup>c</sup>	3,810	3,810	3,682	3,795	3,771	3,852	3,804	3,883	3,754	3,697	3,689	3,686	3,899	
Commercial/Institutional and Industrial Construction Contracts	94.8	75.0	112.1	119.7	82.0	103.0	122.9	142.1	138.5	109.6	75.7	82.9		
Urban Housing Starts (Annual Rate)	34,800	33,600	55,700	53,900	37,200	45,200	67,500	77,500	69,200	106,000	103,800	82,300	60,600	55,600
Money Supply <sup>c</sup>	28,955	28,947	28,817	28,966	29,224	29,668	29,769	29,996	30,132	30,549	31,259	31,826	32,289	
T.S.E. Industrial Index <sup>u</sup>	177.89	183.92	185.17	171.08	154.21	151.53	157.36	160.28	165.8	162.1	168.7	174.4	178.1	177.4
Business Failures <sup>u</sup>	56	71	82	54	65	77	73	48	55	71	74	71	71	
Business Failures — Liabilities <sup>u</sup>	9.9	18.7	4.0	2.2	3.4	8.1	3.1	2.8	5.3	8.1	5.8	7.7	11.6	
<b>Coincidental and Lagging Indicators</b>														
Gross National Product <sup>c</sup> (Annual Rate)			82,684			83,824			84,988				86,376	
<b>Index of Industrial Production<sup>c</sup></b>														
Total Manufacturing <sup>c</sup>	171.1	174.4	171.5	172.4	170.5	170.2	170.0	171.0	169.1	168.6	171.1	170.6	171.4	172.4
Non-Durables <sup>c</sup>	167.8	171.0	168.1	170.0	167.5	167.4	165.4	166.5	163.1	164.3	165.5	165.2	167.1	168.5
Durables <sup>c</sup>	152.3	154.3	152.8	154.8	155.0	152.4	152.8	151.8	152.2	152.0	155.3	152.9	152.7	150.6
Mining <sup>c</sup>	186.8	191.4	186.7	188.6	182.8	185.8	181.7	184.4	176.4	179.9	178.4	180.8	185.3	191.2
Electric Power and Gas Utilities <sup>c</sup>	170.2	175.7	170.6	164.2	166.6	170.8	173.4	174.6	178.2	175.4	186.7	180.9	175.6	176.1
Primary Energy Demand (Annual Rate)	201.0	203.0	203.0	206.4	203.7	205.1	206.1	205.9	208.4	195.0	194.8	200.9	201.4	199.5
Exports (including re-exports) <sup>c</sup>	64.53	63.91	62.94	63.39	61.60	63.35	65.03	65.68	66.80	65.56	64.32	66.79	67.62	67.76
Imports <sup>c</sup>	1,447.0	1,402.1	1,410.1	1,439.0	1,434.1	1,392.2	1,422.7	1,321.1	1,391.3	1,416.0	1,479.8	1,312.0	1,440.0	1,389.0
	1,116.8	1,230.6	1,242.6	1,191.6	1,207.1	1,182.5	1,187.5	1,162.3	1,184.5	1,006.0	1,138.0	1,020.0	1,128.0	1,153.0
<b>Unclassified Indicators</b>														
Foreign Exchange Reserves <sup>c,u</sup>	2,698	2,777	2,936	3,179	3,406	3,650	3,689	3,848	3,785	3,831	3,871	3,813	3,816	
Industrial Materials Price Index <sup>c,u</sup>	272.3	272.3	275.7	274.4	273.7	271.5	270.3	268.5	269.2	267.4	266.4	264.2	264.2	
Consumer Price Index <sup>c,u</sup>	128.2	128.7	128.9	129.7	129.6	129.9	130.5	130.5	130.2	130.3	130.3	129.8	130.3	130.9

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.







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Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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Government of Ontario**

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*Treasurer of Ontario and Minister of Economics*  
**H. Ian Macdonald**  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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Frost Building, Queen's Park, Toronto 182, Ontario.



# An Econometric Model for the Ontario Economy <sup>1</sup>

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In recent years the increasing complexity of advanced industrial economies has necessitated the use of sophisticated analytical techniques such as econometric models and input-output tables in order to meet the growing need for detailed quantitative analysis. Although several statistical models are now available for the Canadian economy, few attempts have been made at the provincial level largely due to lack of adequate statistical information.

Despite the existing data limitations the Economic Analysis Branch of the Department of Treasury and Economics initiated in 1968, a continuing econometric research program to provide an integrated system of analytical tools for medium and long-term forecasting and the evaluation of alternative economic policies. Within the context of this program three major projects have been completed during the past two years. The first of these projects involved the construction of an input-output table which portrays the structural framework of Ontario's economy in terms of interindustry flows of goods and services, while the second concentrated on the development of a comprehensive set of Provincial Economic Accounts which provide the necessary data base for the formulation of an econometric model for the Province.

The present study describes in detail the recently completed version of the Ontario Econometric Model. The first part of the report outlines the basic concepts and methodology of econometric model building. Part II reviews six econometric models designed for regional economies in the United States and Canada during the last fifteen years. Part III deals with the specification of the Ontario model and outlines the methodology adopted in designing the model and its major characteristics. The final chapter presents the parameter estimates and evaluates the statistical and predictive properties of the equation model.

## THEORETICAL ASPECTS OF ECONOMETRIC MODEL BUILDING

### Research Methodology in Economics

Economists are essentially concerned with understanding the functioning of economic systems by studying the relationships of observable and measurable variables in such systems. An important characteristic which distinguishes economics from natural sciences lies in the method of research used in analysing functional relationships. In natural sciences research methodology is relatively

simple, since it is possible to subject the system under study to laboratory control, and to isolate and analyse the movements of one variable at a time keeping all other variables constant. In economics, on the other hand, the laboratory method is not feasible, because it is impossible to exercise experimental control on economic variables. As a result, economic measurements take place under the full complexity of the system resulting from the simultaneous interaction of a large number of economic, as well as social, political and other factors. Economists, therefore, must resort to other methods of simplifying the system.

### 1.2 Economic Investigations

The problem of any quantitative economic analysis is, essentially, to explain why economic variables, such as consumption, investment, exports, etc., assume certain values over a time span. The basic question is whether there are any laws of economic dynamics which determine what values these variables take at different points in time. If such laws exist we must ask further whether they can be estimated in order to gain knowledge of the structure of economic systems and attempt to improve their performance.

### 1.3 Approaches to Economic Problems

These economic problems may be attacked in various ways depending on the attitude of the particular investigator. In the real world we meet three types of investigators, namely, the naive investigator, the sophisticated investigator and the economic theorist.

The naive investigator postulates that there are no laws of economic dynamics and that economic events are influenced by a myriad of factors which cannot be controlled or predicted. Consequently, the formulation and implementation of economic policies, which attempt to alter the course of economic events, is a fruitless exercise. Needless to say this negative approach is sterile since it implies that the economic system should be left to operate on its own with no extraneous intervention. The Great Depression has taught economists and politicians that it is imperative to influence the operation of the system in order to avoid or minimize the effects of economic disasters.

The sophisticated investigator admits that a system exists but he goes on to argue that it is, in fact, so complex that no feasible model of the system can be explicitly formulated. Let us consider, for example, the demand for a single commodity by a household

during a certain period of time. This demand is a function of a large number of variables, i.e., the price of the commodity in question, the prices of other commodities, the income of the household, the availability of credit and liquid assets, the number of persons in the household, their past consumption habits, their age and educational background etc. And since each household demands several hundreds of different commodities we need an equal number of demand functions to explain its consumption patterns. Moreover, there are several thousands of households in the economic system and, hence, a myriad of functions are required to explain merely the consumption of commodities. The same is true for the production of commodities, the behaviour of investors, governments etc. Following this line of thought, the sophisticated analyst advocates that the magnitude of the research effort lies beyond the available resources. Accordingly, he attempts to assess the situation using his intuition and personal judgement which constitute the basis of his advice on matters of economic policy. The problem is, of course, that "there are about as many types of advice as there are advisors (sometimes even more!)"<sup>1</sup>.

The economic theorist attempts to simplify the economic system by building a theory or model which approximates the real world. The crucial elements of a theory are the assumptions made, the logical process followed and the results. By manipulating his model the economic theorist arrives at policy measures best suited to deal with specific economic problems. There are two difficulties associated with this approach which make its use problematical. First, one finds in economic literature several theoretical models which attempt to explain the same economic phenomena. The question is which model reflects the real world. Secondly, theoretical models are usually deterministic, i.e., the functional relationships are specified in an exact mathematical form without incorporating stochastic components. However, exact relationships are not normally observed in practice and, therefore, deterministic models are not suitable for empirical work because they fail to account for the fact that there is a stochastic and unpredictable element in human behaviour.

### 1.4 The Role of Econometrics

It is evident from the above discussion that we need tools of analysis which would yield objective economic policies, independent of

<sup>1</sup>See L. R. Klein, "The Use of Econometric Models as a Guide to Economic Policy", *Econometrica* (April, 1947) p. 111.



the personal judgement or theory of a particular investigator. "Econometric models are put forth in this scientific spirit, because these models, if fully developed and properly used, eventually should lead all investigators to the same conclusions, independent of their personal whims"<sup>2</sup>.

The role of econometrics is essentially to fill the gap between economic theory and applications, and may be regarded as the natural science approach to economics. Econometric research can provide important information in three major fields of enquiry, namely, in testing economic theories, in forecasting and in policy simulations.

Using econometric methods it is possible to subject different economic theories to empirical test, and thus retain only the theories that are consistent with the facts and reject those which are inconsistent with reality.

Econometric analysis is also a powerful tool for making economic forecasts. There are two considerations however that we must bear in mind when we use this tool of analysis for forecasting. First, it must be realized that econometric models are not magic formulas<sup>3</sup> which unravel the complexity of economic systems in a few equations. Such models can predict the future outcome of economic events, on the basis of historical records, given that households, businessmen and governments continue to behave in the future as they did in the past. Any change in behaviour patterns is reflected in the structure of the system and necessitates the modification of one or more equations in the model before it can be used to make forecasts.

Secondly, econometric forecasts can be expressed as point (single value) forecasts or as interval forecasts. Point forecasts are of the form: if you change variable  $X$  by  $\Delta X$  the effect on variable  $Y$  will be  $\Delta Y$ . Such forecasts may not be realized even when the statistical relationships of the model remain stable and continue to hold in the forecasting period. This is because, unlike the models of economic theorists, econometric models are probabilistic, i.e., each statistical relationship contains a stochastic error term to account for errors of observation or measurement as well as for factors that are not quantifiable. The inclusion of the error term in econometric functions may produce a discrepancy between a single value forecast of an economic variable and its realized value. This, however, reflects the nature of

economic life and is not a defect of econometric models.

Interval forecasts, on the other hand, are of the form: if you change variable  $X$  by  $\Delta X$  the expected effect on variable  $Y$  will be  $\Delta Y$  but the actual effect will lie in the range  $\Delta Y - e$  to  $\Delta Y + e$  with a specified probability level, say, 99 per cent of the time. Such forecasts are of greater importance because they provide an explicit measure of the probabilistic element in economic systems. It is unfortunate that most economists engage themselves in making precise point forecasts. Some of these forecasts subsequently fail to hit the mark and this has raised questions as to the usefulness of econometric models. Hopefully economists will realize the importance of interval forecasts and attempt to produce these more frequently.

Finally, econometric models can be used in simulating policies. It is possible to simulate alternative economic policies and study their implications on the economic system before such policies are actually put into effect. This type of information is extremely useful to policy makers and planners.

### 1.5 Essential Stages of Econometric Model Building

The construction of an econometric model involves the following stages:

- a) The specification of the model
- b) The identification of the stochastic equations in the model
- c) The assembly of relevant statistical information
- d) The estimation of the model
- e) The analysis and testing of the model.

The specification stage, which constitutes the initial step in designing a model, is the mathematical formulation of economic theory in terms of a number of stochastic equations. Each equation contains one dependent variable on the left-hand side and two or more explanatory variables on the right-hand side (including a stochastic variable). At this stage, the designer of the model is faced with four major questions:

- i) What variables should be used in the equations? Variables which are difficult to measure are not normally used unless they are essential to the model. It is not possible, of course, to use variables which are not quantifiable or variables on which data do not exist. In a forecasting model the relevant variables must be available. If current values are not available, lagged variables may be used. In policy simulation, the policy vari-

ables introduced into the model must be those over which the government has control.

- ii) What form of relation should be specified, i.e., linear, log etc.? Linear relationships are simple to estimate and manipulate. The disadvantage of using linear relations is that they may not fit the data very well, resulting in large forecasting errors.

- iii) Should original series or first differences be used. In short-term forecasting, the use of first differences may be more appropriate to analyse an economic system in terms of year-to-year changes, i.e., rates of change of variables, instead of levels.

- iv) What form of lag structure should be specified.

The third stage<sup>4</sup> in the construction of an econometric model involves the collection of data pertaining to the variables chosen in stage one. The model builder must decide on two important issues:

- i) What length of time period should be employed. The number of observations determines the range of experience. In general, the number of years must be sufficiently large to provide enough experience. On the other hand, if a very long period is considered, the model may produce estimated parameters which are subject to change with time.

- ii) What length of time unit should be used. If years are used as units of time, the model may not be realistic. An inventory model, for example, based on annual data would not represent the real world if manufacturers adjust their production and sales quarterly. If quarters are used as time units, the lag structure becomes more complex. Moreover, quarterly data may not be available, and if such data do exist they may be seasonally adjusted.

The estimation stage consists of fitting the model to the data, collected in stage two, by appropriate statistical techniques to obtain numerical estimates of the parameters. The last stage requires that the model be tested and analysed before it is put into operation.

### 1.6 Classification of Economic Variables

The economic variables appearing in the statistical relationships of a simultaneous equation system are conventionally classified as:

- a) Current endogenous variables
- b) Predetermined variables
  - (i) lagged endogenous variables
  - (ii) exogenous variables.

The current endogenous variables are those generated within the economic system.

<sup>2</sup>*ibid.*

<sup>3</sup>See Jack Johnston, "Econometrics: Science or Witchcraft?", *The Manchester Guardian*, August 17, 1965.

<sup>4</sup>The identification problem is discussed in Section 3.20.



ues being determined by the simultaneous interaction of the relations in the system. Examples of such variables are; personal consumption expenditures, business investment, imports, exports etc. Each equation in the system explains one current endogenous variable, which appears on the left-hand side, in terms of other current endogenous and/or predetermined variables appearing on the right-hand side. The current endogenous variables are thus, interdependent and equal in number to the number of relationships (equations) specified in the model. This condition of equality between the number of current endogenous variables and equations is necessary in order to obtain a unique solution of the system.

The predetermined variables are generated outside the economic system and their values are determined by non-economic factors.

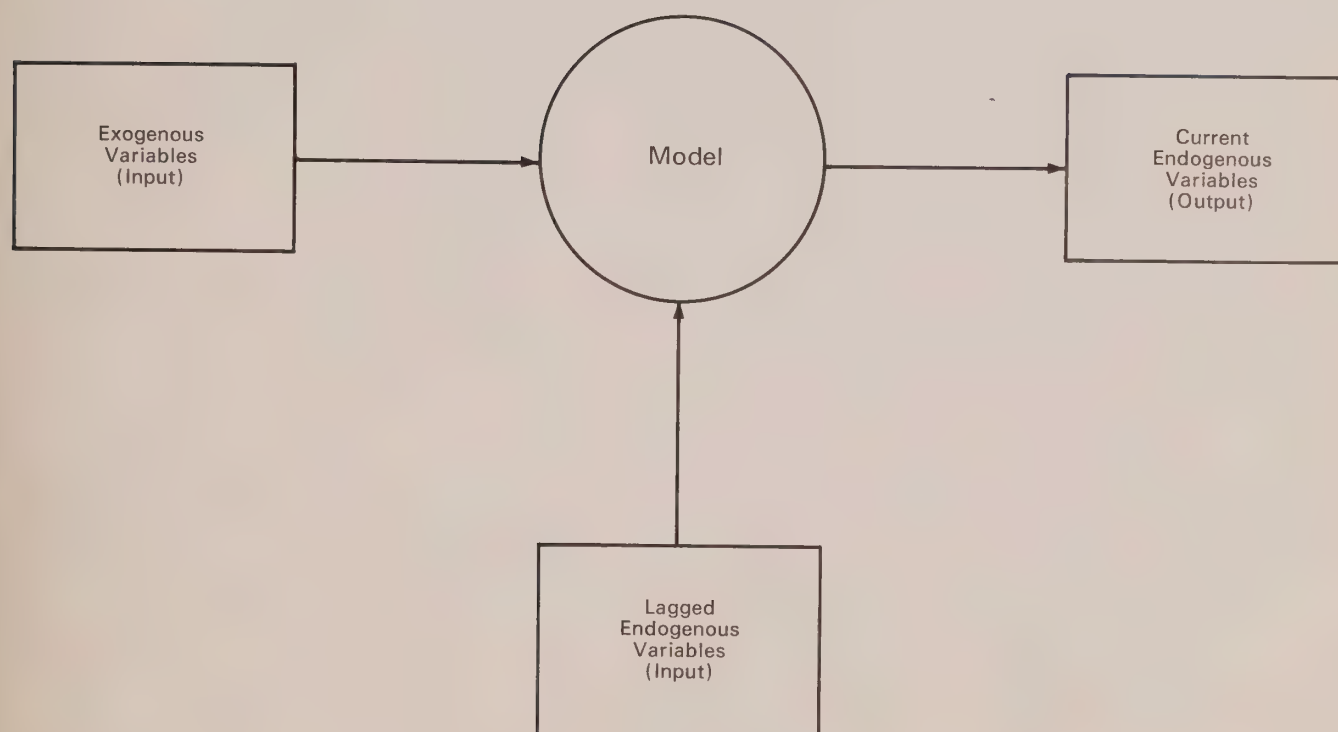
They consist of lagged endogenous variables, such as past levels of income, consumption etc., which affect the system with a delay of one or more time periods, and exogenous variables, such as climate, government decisions etc., which are extraneous to the system. The predetermined variables exert a unidirectional influence on the economic system, in the sense that they affect the outcome of the current endogenous variables without being affected by them. Consequently, there are no equations in the system explaining predetermined variables.

The classification of variables into endogenous and exogenous is a relative one, depending on the particular model at hand, especially its size and the purpose for which it was constructed. Some of the variables denoting, for instance, per capita income, the rate of unemployment etc., are called "target

variables". Other variables representing monetary aspects of the system or government spending are sometimes referred to as "policy variables". A target variable normally represents a welfare index, whereas a policy variable is an instrument in the hands of policy makers and planners. Economic policy, then, may be thought of as the coordinate of actions directed towards changing and manipulating the policy variables in order to produce desirable effects on the target variables.

Using the concepts of endogenous and predetermined variables we can represent the operation of an econometric model in a schematic form as shown in Diagram 1-1. In each time period, values of the lagged endogenous and exogenous variables are fed into the model as input, and values for the current endogenous variables are generated as output.

**Diagram 1-1. Operation of an Econometric Model**



1.7 Classification of Econometric Models

This Section attempts a classification of econometric models to facilitate the discussion in later chapters. We may distinguish four broad groups of models depending on:

- a) The purpose for which they are constructed
  - b) The data used in their estimation
  - c) The area to which they relate
  - d) The way in which they are designed.
- Each of these major groups can be further

sub-divided into a number of sub-groups. Thus, using the purpose as a guideline, we distinguish theory-testing, forecasting and policy models. Forecasting models, in turn, may be classified as short-term and long-term models.

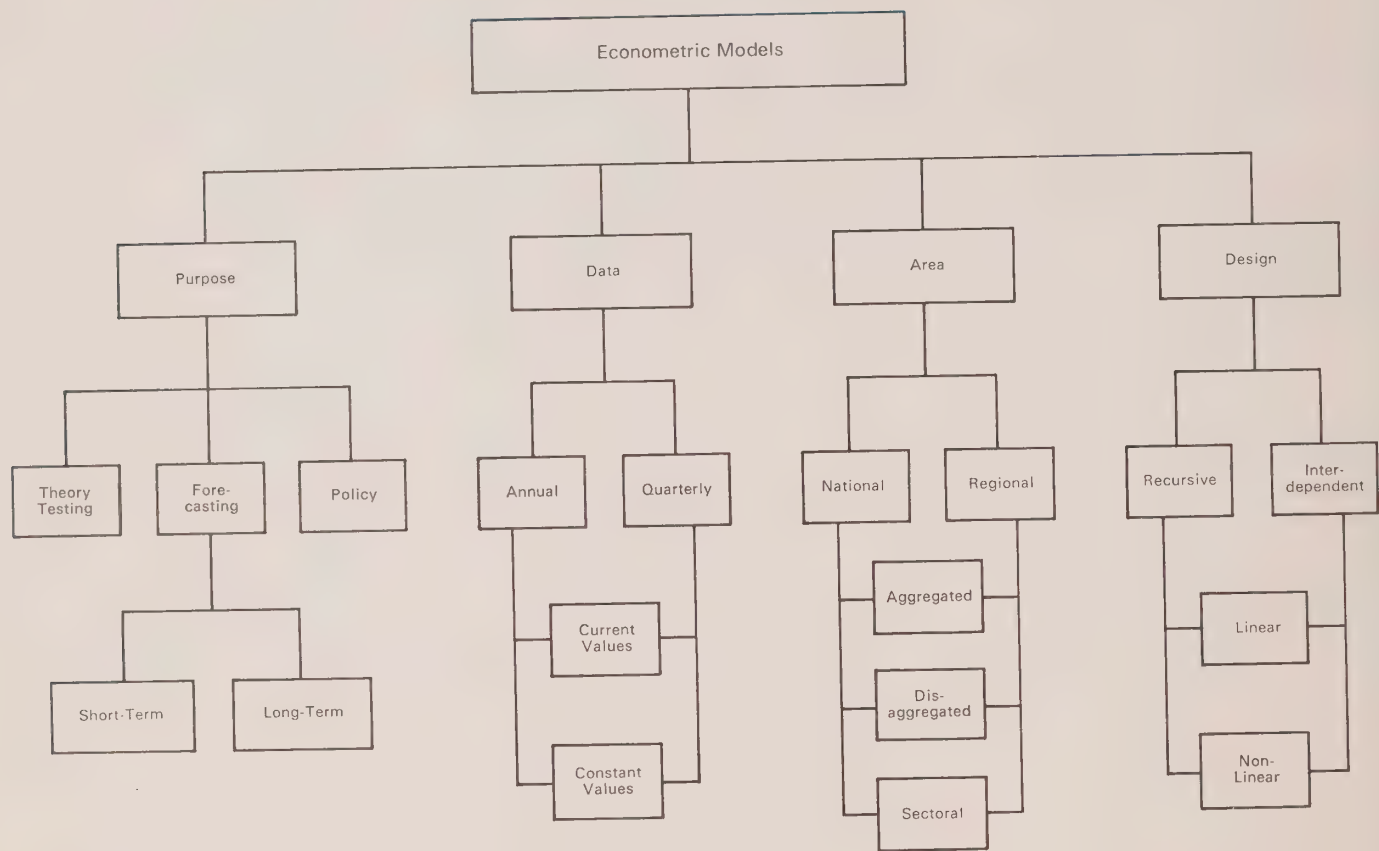
The data criterion produces two major sub-groups, namely, annual versus quarterly models, depending on whether they utilize annual or quarterly data. Such data may be either in current or constant dollars or a

mixture of both.

The area group can be broken down into national and sub-national (regional) models which can be of varied degrees of aggregation, and may relate to the entire economy (macro-models) or to some sectors of the economy (micro-models).

Finally, the design criterion yields recursive versus interdependent models, either linear or non-linear (i.e., linear in parameters but not necessarily linear in variables).

Diagram 1-2. Classification of Econometric Models



This classification is illustrated in Diagram 1-2. A particular model, of course, may combine several of the above features, eg., it may be an aggregate national short-term forecasting interdependent model, estimated on the basis of quarterly series expressed in constant dollars. Two pairs of models, namely, national vs regional and recursive vs interdependent are very significant for the Ontario model and deserve special attention.

1.8 National vs Provincial or State Models

Econometric models of the national economy

have two important advantages over provincial or state models. The first relates to the quality and quantity of data available for their estimation. National models employ national statistical series which are available on a quarterly basis in current as well as in constant dollars. On the other hand, provincial models utilize provincial data, normally derived from a decomposition of national statistics. Due to the estimation problems involved in decomposing national data, the provincial series can at best be estimated on an annual basis at current prices. Conse-

quently, in designing a provincial model is faced with various data constraints which are not encountered at the national level.

The lack of quarterly data at the provincial level is a serious problem for two reasons. First, it excludes the possibility of formulating a quarterly model, which would be a better approximation of the provincial economic system. Secondly, it restricts the range of experience for a specified period. If we wish, for example, to study the performance of the Ontario economy in the period 1957-68, quarterly data will pro-



observations whereas annual data will have only 12 observations. Similarly, the lack of price deflators at the provincial level makes it impossible to convert data from current to constant dollars. This difficulty poses a constraint on the specification of a provincial model, in the sense that certain important relationships cannot be included in it. A production function, for example, specified in terms of current variables can be of limited use in assessing the effects of growth of output on employment, because it is measured in real terms and not inflation that regulates employment.

The second advantage of national models over provincial is that they can incorporate a wider choice of policy variables. National models normally contain relationships which explain policy variables directly controlled by the federal government, i.e., variables denoting the money supply, interest rates, mortgage yields, unemployment insurance payments, federal taxes, import duties etc. These variables exert a direct effect on the provincial economy and should, ideally, be included in a provincial model as endogenous. However, provincial authorities have no direct control over variables which fall within federal jurisdiction. Consequently, in provincial models such variables are treated as exogenous. This is one of the reasons why national models lack a monetary sector. Although the above limitations of provincial and state models are undesirable they do not diminish the importance and usefulness of these models in analysing this type of economy.

### Recursive vs Interdependent Models

The concepts of recursiveness and interdependency in econometric models are closely associated with the notion of causality<sup>5</sup> in the sense of a stimulus-response relationship among variables. Interdependent models contain variables which are mutually interdependent, i.e., if  $X$  and  $Y$  denote two variables then  $X \rightarrow Y$  and  $Y \rightarrow X$ , where the arrows indicate the direction of causation. In recursive models, on the other hand, the variables are not mutually interdependent, the causation is unidirectional so that  $X \rightarrow Y$  but not  $Y \rightarrow X$  or vice versa.

The formal properties of a recursive model can best be illustrated with the use of a simple example. Consider a highly aggregated linear model consisting of a consump-

tion function, an investment function, and the familiar national income identity.

$$C_t = \gamma_{11} Y_{t-1} + u_{1t} \quad (1-1)$$

$$I_t = \beta_{21} C_t - \gamma_{21} C_{t-1} + u_{2t} \quad (1-2)$$

$$Y_t = C_t + I_t + G_t \quad (1-3)$$

where  $C$  denotes consumption,  $Y$  income,  $I$  private investment,  $G$  government expenditure, and  $u_{1t}$ ,  $u_{2t}$  are random disturbances. All variables are dated by using the subscript  $t$  which refers to time. Government expenditure,  $G_t$ , is considered to be the only exogenous variable in the model and hence we have three current endogenous, and three predetermined variables (two lagged endogenous and one exogenous).

We now attempt an ordering of equations and variables in the following fashion:

$$\begin{array}{rcl} C_t & - \gamma_{11} Y_{t-1} & = u_{1t} \\ - \beta_{21} C_t + I_t & + \gamma_{21} C_{t-1} & = u_{2t} \\ - C_t - I_t + Y_t & - G_t & = 0 \end{array}$$

We can write these equations in matrix form as

$$\begin{bmatrix} 1 & 0 & 0 \\ -\beta_{21} & 1 & 0 \\ -1 & -1 & 1 \end{bmatrix} \begin{bmatrix} C_t \\ I_t \\ Y_t \end{bmatrix} + \begin{bmatrix} -\gamma_{11} & 0 & 0 \\ 0 & \gamma_{21} & 0 \\ 0 & 0 & -1 \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ C_{t-1} \\ G_t \end{bmatrix} = \begin{bmatrix} u_{1t} \\ u_{2t} \\ 0 \end{bmatrix}$$

or

$$BY_t + \Gamma X_t = u_t \quad (1-4)$$

where  $B$  is a  $(3 \times 3)$  matrix of coefficients of current endogenous variables

$Y_t$  is a  $(3 \times 1)$  vector of current endogenous variables

$\Gamma$  is a  $(3 \times 3)$  matrix of coefficients of predetermined variables

$X_t$  is a  $(3 \times 1)$  vector of predetermined variables

$u_t$  is a column vector of disturbances.

The  $B$  matrix is always a square matrix because of the equality between structural equations and current endogenous variables, whereas the  $\Gamma$  matrix need not necessarily be square. Thus, in models containing  $i$  equations in  $i$  endogenous variables the  $B$  matrix is of order  $(i \times i)$  and can be defined as

$$B = \beta_{ij}$$

A model then, such as (1-4), is said to be recursive if the following two conditions are satisfied:

a) The  $B$  matrix is triangular, that is,

$$\beta_{ij} = 0 \text{ for all } j > i \quad (1-5)$$

b) The variance-covariance matrix of disturbances is diagonal, that is,

$$E(u_{it} u_{jt}) = 0 \text{ for all } j \neq i \quad (1-6)$$

Condition (1-6) is referred to as the assumption of serial independence of the disturbance

terms. Whether this condition holds can only be detected at the estimation stage of a model. It is customary, however, at the specification stage before a model has been estimated, to use condition (1-5) as a criterion of recursiveness or non-recursiveness. This is legitimate so long as one remembers that this formal condition is necessary but not sufficient. Using condition (1-5) we can state that our simple model consisting of equations (1-1), (1-2) and (1-3) is recursive since the  $B$  matrix is triangular.

Consider next the case where equation (1-1) is replaced by

$$C_t = \beta_{11} Y_t + u_{1t} \quad (1-7)$$

The resulting model of equations (1-7), (1-2) and (1-3) is non-recursive or interdependent, since it is no longer possible to arrange the equations so as to obtain a triangular  $B$  matrix. This matrix is now

$$B = \begin{bmatrix} 1 & 0 & -\beta_{11} \\ -\beta_{21} & 1 & 0 \\ -1 & -1 & 1 \end{bmatrix}$$

which, of course, is not triangular.

There is much controversy in econometric literature over these two types of models. The Klein school of thought argues in favour of the interdependent models, while the Wold school leans toward the recursive models. There are no criteria for deciding, *a priori*, on the type of model to be used on specific occasions. Recursive models have the advantage that they can be estimated by Ord-

nary Least-Squares, which is not true for interdependent models. On the other hand, interdependent models are more flexible in their specification since they do not demand that the B matrix be triangular. The final choice between these types of models depends primarily on the availability of data.

## II ECONOMETRIC MODELS OF STATES AND PROVINCES: A SURVEY

### 2.1 Regional Econometric Models

The previous chapter outlined the basic concepts and methodology of econometric model building. This chapter examines six sub-national models for the States of Massachusetts, Ohio, Georgia, Michigan and the Provinces of Nova Scotia and Prince Edward Island. These models can be used as a guideline for evaluating the Ontario model presented later.

### 2.2 The Econometric Model of the State of Massachusetts

The Massachusetts model was constructed by Frederick W. Bell<sup>1</sup>, Regional Economist at the Federal Reserve Bank of Boston. It is essentially a Keynesian model designed to forecast the long-term demand and supply of labour in the Massachusetts region. The model consists of eight stochastic equations and six definitional identities, thus explaining fourteen regional economic variables in terms of regional predetermined variables, with the exception of one national variable denoting GNP. It contains one export function, one consumption function, two investment functions, and three equations explaining labour supply, migration and wages.

The model was fitted to annual data for the period 1947-62 expressed in constant dollars. The estimated equations are shown here, where the numbers in parentheses beneath the coefficients are their standard errors.  $R^2$  is the unadjusted coefficient of multiple determination and DW denotes the Durbin-Watson d statistic.

The author claims that his model is essentially recursive<sup>2</sup>. However, one can detect a two-way causation between the variables  $S_t$  and  $(V_1)_t$  in equations (2-2) and (2-12). To overcome this difficulty, Bell estimated the parameters of equation (2-2) by Indirect Least-Squares (ILS), i.e., by applying Ordinary Least Squares (OLS) to the reduced form of the income determination block of

#### Stochastic Equations

$$X_t = 430.55 + 6.71 \text{ GNP}_t \quad (103.86) \quad (0.329) \quad (2)$$

$$R^2 = 0.967 \quad DW = 1.114$$

$$S_t = -135.1 + 0.7297 (V_1)_t \quad (2)$$

$$\log (k_m)_t - \log (k_m)_{t-1} = 0.5113 + 0.939 \log X_t - 1.023 \log K_{t-1} - 0.0062 t \quad (1.007) \quad (0.289) \quad (0.211) \quad (0.0032) \quad (2)$$

$$R^2 = 0.712 \quad DW = 1.447$$

$$\log (k_{nm})_t = 0.8389 + 0.798 \log S_t \quad (0.2265) \quad (0.096) \quad (2)$$

$$R^2 = 0.927 \quad DW = 1.251$$

$$(V_2)_t = 6422 K^{0.29} L^{0.71} (1.013)^t \quad (0.00128) \quad (2)$$

$$R^2 = 0.908 \quad DW = 1.580$$

$$(Ne)_t = 0.4009 (Pe)_t \quad (0.00027) \quad (2)$$

$$R^2 = 0.988 \quad DW = 1.465$$

$$M_t = 106.22 - 1.0385 (Ne - L)_{t-1} \quad (33.63) \quad (0.279) \quad (2)$$

$$R^2 = 0.500 \quad DW = 1.504$$

$$W_t = 2657 (1.017)^t \quad (0.0011) \quad (2)$$

$$R^2 = 0.944 \quad DW = 1.533$$

#### Identities

$$(Pe)_t = (Po)_{t-1} + (B - D) (Po)_{t-1} \quad (1)$$

$$(No)_t = 0.4009 (Pe)_t + 0.4009 M_t \quad (2-)$$

$$(V_2)_t / (V_1)_t = 0.907 \quad (2-)$$

$$(V_1)_t = S_t + X_t \quad (2-)$$

$$U_t = (No)_t - L_t \quad (2-)$$

$$k_t = (k_m)_t + (k_{nm})_t \quad (2-)$$

#### Current Endogenous Variables

$X_t$	export income (i.e., income from product sales plus capital income from investment in other regions plus transfer payments from the federal government)
$S_t$	local service income
$(k_m)_t$	manufacturing capital stock
$(k_{nm})_t$	non-manufacturing capital stock
$(V_2)_t$	total produced income
$(Ne)_t$	expected labour supply (natural increase)
$M_t$	migration
$W_t$	annual wage per employee
$(Pe)_t$	expected population (natural increase)
$(No)_t$	labour supply (actual)

<sup>1</sup>See F. W. Bell, "An Econometric Forecasting Model for a Region", *Journal of Regional Science*, Vol. 7, No. 2, 1967, pp. 109-127.

<sup>2</sup>*Ibid*, p. 119.



$Y_t$	total received income (local service income plus export income, i.e., income received but not produced in the region)
$U_t$	unemployment
$K_t$	total capital stock
determined variables	
$P_t$	gross national product
$(D)_t$	birth rate (per thousand) minus death rate (per thousand)
$(\Delta L)_t$	prospective unemployment lagged one period (difference between natural increase in the labour force and labour supply)
$K_{t-1}$	capital stock in manufacturing lagged one period
$K_{n,t-1}$	capital stock in non-manufacturing lagged one period
$K_{t-1}$	total capital stock lagged one period
$P_{t-1}$	population (actual) lagged one period
$t$	time

model consisting of equations (2-1), (2) and (2-12), which we can write as

$$Y_t = \alpha_1 + \beta_1 \text{GNP} \quad (2-15)$$

$$Y_t = \alpha_2 + \beta_2 (V_1)_t \quad (2-16)$$

$$(V_1)_t = S_t + X_t \quad (2-17)$$

the procedure used to obtain  $\hat{\alpha}_2$  and  $\hat{\beta}_2$ , estimates of  $\beta_2$  and  $\alpha_2$  respectively, involved: the application of OLS to equation (2-16) to obtain a computed series,  $X^*_t$ , of variable  $X_t$ .

the substitution of  $X^*_t$  and equation (2-16) into equation (2-17) to obtain

$$(V_1)_t = \frac{\alpha_2}{1-\beta_2} + \frac{1}{1-\beta_2} X^*_t \quad (2-18)$$

the application of OLS to (2-18) to obtain numerical values of the constant term and the coefficient of  $X^*_t$ , which we shall denote by  $x$  and  $y$  respectively, so that

$$\frac{\alpha_2}{1-\beta_2} = x \quad (2-19)$$

$$\frac{1}{1-\beta_2} = y \quad (2-20)$$

Equation (2-20) yields  $\hat{\beta}_2 = (y-1)/y$ , which substituted into (2-19) gives  $\hat{\alpha}_2 = x/y$ . This estimation procedure is questionable because equation (2-18) is not the true reduced form of the income block and there is no justification for regressing one endogenous variable,  $(V_1)_t$ , on another  $X_t$ . Consequently, the estimates of (2-2) are likely to be biased and inconsistent<sup>3</sup>. This problem could be avoided by using the following estimation procedure:

First, apply OLS to (2-15) to obtain  $\hat{\alpha}_1$  and  $\hat{\beta}_1$ , estimates of  $\alpha_1$  and  $\beta_1$ .

Secondly, substitute (2-15) and (2-16) into (2-17) to obtain the true reduced form of the income determination sub-model

$$(V_1)_t = \frac{\alpha_1 + \alpha_2}{1-\beta_2} + \frac{\beta_1}{1-\beta_2} \text{GNP} \quad (2-21)$$

which contains no endogenous variables on the right-hand side.

Finally, apply OLS to (2-21) to obtain numerical values for the constant  $x'$ , and the coefficient of GNP,  $y'$ , so that

$$\frac{\alpha_1 + \alpha_2}{1-\beta_2} = x' \quad (2-22)$$

and

$$\frac{\beta_1}{1-\beta_2} = y' \quad (2-23)$$

Solving equations (2-22) and (2-23) simultaneously yields

$$\hat{\alpha}_2 = \frac{\hat{\beta}_1 x' - \hat{\alpha}_1 y'}{y'} \text{ and } \hat{\beta}_2 = 1 - \frac{\hat{\beta}_1}{y'}$$

Due to this indirect estimation procedure, the standard errors in equation (2-2) as well as the coefficient  $R^2$  are not given. The two investment equations (2-3) and (2-4) were estimated after  $X_t$  and  $S_t$  were replaced by their computed values  $X^*_t$  and  $S^*_t$  respectively. For the production function (2-5), estimates of the exponents were obtained from factor shares accruing to capital and labour. The remaining equations were estimated by Ordinary Least Squares.

Most of the statistical series used to estimate the model were taken directly from

standard sources. A few series, such as export income and capital stock, were not readily available and had to be estimated. Export income consists of two components; wages and salaries originating in the export sector, and profits originating in the same sector. The first component was estimated by the use of location coefficients<sup>4</sup>. The second component was derived by using the personal income series for Massachusetts as a benchmark, and making adjustments upward for dividends at the regional level and imputed interest. First, receipts of government interest were eliminated, then dividends were proportionally increased so as to include undistributed corporate profits, inventory valuation adjustment and corporate profit tax liability, using the national ratio of total corporate profits to dividends. Finally, imputed interest was increased by the amount of interest previously written off as business expense.

Data for manufacturing capital stock were taken from the Annual Census by the Massachusetts Department of Labor and Industries. These stock series were adjusted by using Creamer's<sup>5</sup> deflators for working and fixed capital at the two-digit industrial level. The stock figures for non-manufacturing capital were first computed at the national level for five major non-manufacturing sectors from data available in W. Leontief, "Factor Proportions and the Structure of American Trade", *Review of Economics and Statistics*, Vol. 38 (1961) pp. 386-407. These national stock figures for non-manufacturing capital were then scaled down to the regional level for Massachusetts, using the Cobb-Douglas production function. All income data were deflated using the Schultze and Tryon<sup>6</sup> index for income originating.

The predictive accuracy of the Massachusetts model was remarkably high. Although it was primarily designed for long-term forecasting the model also predicted accurately the short-term fluctuations in labour demand. The model was used to project the supply and demand for labour in the region for the period 1966-80, given the regional birth and death rates and the rate of growth in GNP. It was found that if the growth rate in GNP is 2.9 per cent, the unemployment rate in the region will be reduced from 5.7 per cent in 1966 to 5.5 per cent in 1980. However, if GNP grows by 4.9 per cent a year in the period 1966-80, the rate of unemployment will drop to 3.0 per cent by the end of the period.

<sup>3</sup>See D. Creamer, *Capital Expansion and Capacity in Postwar Manufacturing*. Studies in Business Economics No. 72, New York: National Conference Board, Inc., 1961.

<sup>6</sup>See C. L. Schultze and J. L. Tryon, *Prices and Costs in Manufacturing Industries*. Study Paper No. 17 prepared for the Joint Economic Committee, Washington, D.C., Government Printing Office, 1960.

### 2.3 The Econometric Model of the State of Ohio

The designers of the Ohio model are W. L. L'Esperance, G. Nestel and D. Fromm<sup>7</sup> of the Ohio State University. The purpose of the model was, essentially, to perform policy analysis by considering alternative values of one exogenous variable, namely, prime military contracts awarded in Ohio. As in the case of Massachusetts, this model was developed along Keynesian lines, but its size is somewhat larger consisting of sixteen behavioural equations and eleven identities in twenty-seven current endogenous variables. The Ohio model divides the State economy into five major sectors; consumer, investment, state fiscal, output and personal income, and federal income tax.

The authors developed a set of economic accounts for estimating the gross state product (GSP) of Ohio by industry for the period 1955-65 using the value-added method introduced by Kendrick and Jaycox<sup>8</sup>. In constructing GSP, three major economic sectors were distinguished; farm, private non-farm and government. Estimates of gross farm product in Ohio are published by the U.S. Department of Agriculture.

Data for private non-farm income by state are available from the U.S. Department of Commerce for income received but not for income originating. The latter includes, in addition to wages and salaries, corporate profits and net interest. The state's income received was inflated to an income-originating basis using the national ratios of income originating to income received in each of the industry groups. This procedure is based on the assumption that the factor shares within each industry group of the state are the same as those of the nation.

The gross government product consists of wages and salaries of government employees, including military personnel. Data on wages and salaries at the state level are available from the U.S. Department of Commerce. Since supplements to wages and salaries were unavailable this item was estimated by applying "the national federal, state and local governments ratio of income originating to wages and salaries to each of Ohio's federal, state and local government wages and salaries figure."<sup>9</sup>

The Ohio model was estimated on the basis of fifteen annual observations for the period 1949-63. All data were converted to constant 1958 dollars. Unfortunately, there is no mention in the study of the method

used to deflate the series. The equations of the model are shown below. The numbers in parentheses below the coefficients are values.

#### Behavioural Equations

$$R = 3.757 + 0.304 \text{ DPI} \quad (10.01) \quad (14.27) \quad R^2 = 0.94 \quad DW = 0.84 \quad (2-2)$$

$$A = -0.952 + 0.278 \text{ DPI} + 0.632 \frac{\Delta AC}{AC} - 0.764 \text{ AR}_1 \quad (-2.01) \quad (2.90) \quad (2.09) \quad (-1.81) \quad R^2 = 0.77 \quad DW = 1.44 \quad (2-2)$$

$$I_{sma} = 0.288 + 0.263 I_{mma} - 0.058 \text{ RCB} \quad (2.85) \quad (2.82) \quad (-3.48) \quad R^2 = 0.67 \quad DW = 1.66 \quad (2-2)$$

$$I_{mma} = -1.150 + 0.144 \text{ IGF}_{ma} + 0.384 \text{ IGF}_{ma-1} + 0.010 I_{sma-1} + 0.064 \text{ RTBS} \quad (-2.65) \quad (1.42) \quad (4.06) \quad (2.09) \quad (1.71) \quad R^2 = 0.63 \quad DW = 1.98 \quad (2-2)$$

$$\text{IGF}_{ma} = 0.501 + 0.156 \Delta \text{GSP}_{ma} + 0.193 \text{GSP}_{ma} \quad (2.40) \quad (4.40) \quad (10.35) \quad R^2 = 0.92 \quad DW = 1.02 \quad (2-2)$$

$$\text{PI} = -2.554 + 0.879 \text{ GSP} - 0.265 \Delta \text{GSP} \quad (-2.77) \quad (24.67) \quad (-3.17) \quad R^2 = 0.98 \quad DW = 0.49 \quad (2-2)$$

$$\text{FIT} = -0.995 + 0.173 \text{ PI} \quad (-3.29) \quad (11.53) \quad R^2 = 0.94 \quad DW = 1.01 \quad (2-2)$$

$$\Delta \text{GSP}_{ma} = -0.515 + 0.115 \Delta \text{GNP}_{ma} + 0.263 \text{ MPC} \quad (-5.18) \quad (21.90) \quad (3.39) \quad R^2 = 0.97 \quad DW = 1.38 \quad (2-2)$$

$$\text{GSP}_{td} = -1.835 + 0.269 A + 0.584 R \quad (-3.26) \quad (0.86) \quad (5.61) \quad R^2 = 0.96 \quad DW = 0.76 \quad (2-2)$$

$$\text{GSP}_{cc} = -0.055 + 2.344 I_{sma} + 0.013 \text{ HP} \quad (-0.26) \quad (6.93) \quad (3.94) \quad R^2 = 0.85 \quad DW = 1.58 \quad (2-2)$$

$$\text{GSP}_{fi} = -1.039 + 0.203 \text{ DPI} - 0.085 \Delta \text{DPI} \quad (9.211) \quad (32.02) \quad (-2.76) \quad R^2 = 0.99 \quad DW = 1.06 \quad (2-2)$$

$$\text{GSP}_{so} = -0.463 + 0.148 \text{ DPI} - 0.028 \Delta \text{DPI} \quad (-3.18) \quad (18.14) \quad (-0.70) \quad R^2 = 0.97 \quad DW = 0.79 \quad (2-2)$$

$$\Delta \text{GSP}_{(other)} = 0.016 + 0.091 \Delta \text{GSP}_{(known)} \quad (0.64) \quad (5.19) \quad R^2 = 0.45 \quad DW = 1.73 \quad (2-2)$$

$$F_t = -0.115 + 0.902 \text{ AR} \quad (-1.59) \quad (37.76) \quad R^2 = 0.99 \quad DW = 0.92 \quad (2-2)$$

$$\Delta \text{AR} = 0.107 + 0.170 A - 0.087 \text{ AR}_1 \quad (2.77) \quad (4.90) \quad (-4.88) \quad R^2 = 0.95 \quad DW = 2.02 \quad (2-2)$$

$$T_s = -0.085 + 0.028 C \quad (4.07) \quad (14.00) \quad R^2 = 0.93 \quad DW = 2.23 \quad (2-2)$$

<sup>7</sup>See W. L. L'Esperance, G. Nestel and D. Fromm, "Gross State Product and An Econometric Model of A State." *Journal of the American Statistical Association*, Vol. 64, No. 327 (September, 1969) pp. 787-807.

<sup>8</sup>See J. W. Kendrick and C. M. Jaycox, "The Concept and Estimation of Gross State Product", *The Southern Economic Journal*, Vol. XXXII, No. 2 (October, 1965) pp. 153-68.

<sup>9</sup>L'Esperance, *Op. Cit.* p. 789.



ities

$$A + R \quad (2-40)$$

$$= I_{sma} + I_{mma} \quad (2-41)$$

$$= PI - FIT \quad (2-42)$$

$$\Delta I = DPI - DPI_{-1} \quad (2-43)$$

$$P = \Delta GSP_{(other)} + \Delta GSP_{(known)} \quad (2-44)$$

$$= GSP_{-1} + \Delta GSP \quad (2-45)$$

$$P_{(known)} = GSP_{ma} + GSP_{cc} + GSP_{td} + GSP_{so} + GSP_{fi} + GSP_{fg} + GSP_{sig} \quad (2-46)$$

$$P_{(known)} = GSP_{(known)} - GSP_{(known)-1} \quad (2-47)$$

$$P_{(other)} = GSP_{(other)-1} + \Delta GSP_{(other)} \quad (2-48)$$

$$P_{ma} = GSP_{ma-1} + \Delta GSP_{ma} \quad (2-49)$$

$$= AR_{-1} + \Delta AR \quad (2-50)$$

#### Endogenous Variables

retail sales in Ohio excluding new-car dealer sales	$\Delta GSP$	annual change in Ohio's gross state product
sales by new car dealers in Ohio	$GSP$	Ohio's gross state product
investment expenditures for plant (structures) by all manufacturing establishments in Ohio	$GSP_{(known)}$	defined in identity (2-46)
investment expenditures in machinery by all manufacturing establishments in Ohio	$\Delta GSP_{(known)}$	annual change in $GSP_{(known)}$
internally generated funds in manufacturing	$GSP_{(other)}$	the sum of gross state products in agriculture, mining, transportation, communication and public utilities
personal income in Ohio	$\Delta GSP_{(other)}$	$GSP_{(other)} - GSP_{(other)-1}$
federal income taxes of Ohio	$GSP_{ma}$	gross state product in manufacturing
annual change in GSP originating in manufacturing	$AR$	automobile registrations in Ohio
gross state product in trade	Exogenous Variables	
gross state product in contract construction		
gross state product in finance, insurance and real estate		
gross state product in services and other		
gallons of taxable motor fuel sold in Ohio		
annual change in automobile registrations in Ohio		
retail sales tax receipts		
sales by all establishments selling at the retail level in Ohio		
total investment expenditures for plant and machinery		
Ohio disposable personal income		
annual change in disposable personal income		
	AC	dollars of automobile instalment credit outstanding in the U.S.
	$\Delta GNP_{ma}$	change in GNP in manufacturing
	$GSP_{fg}$	gross state product in federal government
	$GSP_{sig}$	gross state product in state and local government
	HP	new housing units authorized in permit issuing outlets in Ohio
	MPC	military prime contracts awarded in Ohio
	RCB	interest rate on corporate bonds
	RTBS	interest rate on 90-day U.S. Treasury Bills

for to its estimation the identification of model was established by using the order for identifiability, which is necessary but not sufficient. It was found that all equations were over-identified. The Ohio

model is essentially interdependent, although two blocks of equations form recursive sub-models. Each equation in the model was estimated by both Ordinary Least Squares (OLS) and Two-Stage Least Squares

(TSLS). The equations presented above are those estimated by TSLS.

The Ohio model was used to study policy implications resulting from changes in military prime contracts awarded in the State.

During the Korean War in 1951 Ohio's share of the U.S. total military prime contracts awarded was 6.9 per cent, but by 1965 it had dropped to only 3.2 per cent. If Ohio had retained its peak share during the period 1954-64, the model predicts that the rate of growth of GSP would have increased from 0.52 per cent in 1954 to 7.54 per cent in 1964.

## 2.4 The Econometric Model of the State of Georgia

The Georgia model is the oldest of all regional models surveyed in this Chapter. It was designed by Henry Thomassen<sup>10</sup> of the Prudential Insurance Company of America, for the purpose of appraising the growth potential of Georgia State in terms of national and regional income influences, technological change, population increase and other growth factors.

Thomassen first established the dependence of Georgia's industries upon national aggregates by considering the relative employment concentrations in the various industries using location coefficients. A location coefficient,  $L_i$ , of industry  $i$  in the state is defined as

$$L_i = \frac{(E_s)_i}{\sum (E_s)_i} \cdot \frac{\sum (E_n)_i - \sum (E_s)_i}{(E_n)_i - (E_s)_i}$$

where  $(E_s)_i$  denotes employment in industry  $i$  in the state and  $(E_n)_i$  is employment in industry  $i$  in the nation. For any state industry  $i$  if  $L_i$  is greater than one, it is concluded that the state has a comparative advantage in this line of production and therefore, industry  $i$  is judged as export-oriented. Conversely, if  $L_i$  is less than one the industry is judged as local.

Using location coefficients the author classified twenty-one major industries in Georgia into three groups:

- Local
- Export-oriented to the Southeast region excluding Georgia
- Export-oriented to the rest of the United States.

Having determined the national, regional and local dependency of Georgia industries, Thomassen estimated twenty-two employment functions, one for each industry plus one for government employment. All functions were of the following statistical form:

$$E_i = \alpha + \beta Y$$

where  $E_i$  is employment (thousands of

workers) in the  $i$ th industry in Georgia,  $Y$  denotes income (billions of 1947-49 dollars), and  $\beta$  is the employment multiplier. The income variable was different for each of the industry groups. In the case of local industries  $Y$  denoted income of the state of Georgia, whereas for groups (b) and (c)  $Y$  represented income of the Southeast region and the U.S. respectively. The equations were estimated on the basis of seven annual observations for the period 1947-54 from data available in the Statistical Abstract of the United States, 1956. The standard errors of the estimated coefficients and the coefficients of multiple determination are not given.

The Georgia model was used to project employment in the state by industry for the period 1955-60, on the assumption that income in the U.S., the Southeast region and Georgia would grow at the rate of 4.9 per cent, 4.4 per cent and 5.5 per cent respectively. Among the U.S.-oriented export industries, those producing non-durables had the greatest impact on employment, contributing 27,500 new jobs. From the Southeast oriented export industries, wholesale and retail trades showed the greatest increase in employment — about 51,000 workers, while construction was the most significant local industry adding over 20,000 workers.

## 2.5 The Econometric Model of the State of Michigan

The econometric model of Michigan was prepared by the Research Seminar in Quantitative Economics of the University of Michigan,<sup>11</sup> under the directorship of Daniel B. Suits, for the Michigan Department of Commerce. The model is essentially a forecasting device for preparing short-term forecasts of the Michigan economy. It relates Michigan's economic performance to various national variables, taken as exogenous, the most important of them being the national demand for motor vehicles and parts, and the demand for new durable equipment.

The study was written in non-technical terms and the statistical relationships are not explicitly stated. It is difficult to judge the size of the Michigan model; it appears that it consists of about thirty equations explaining annual changes in gross state product and its major components, retail sales, labour force employment and unemployment, personal income by major categories, population and state taxes.

For the most part the statistical series to estimate the model relate to the period 1949-63 and are expressed in constant 1963 dollars. Estimates of gross state product obtained on the basis of value-added by the industrial sector. The value-added figures for the manufacturing sector were taken from the *Annual Survey of Manufactures*. Because these figures include purchases of services from other industries, they were adjusted by applying the ratio of U.S. GNP in manufacturing to U.S. manufacturing value-added.

For the mining sector, value-added estimates are available from the U.S. Census of Mineral Industries taken every four years. "The intervening years were interpolated by estimating the change of the ratio of value added to personal income from mining on a linear trend between the census years, applying this ratio to the figures for personal income from mining."<sup>12</sup>

Estimates of income originating in the industrial sectors within Michigan were obtained by using the ratio of GNP originating in each sector to personal income from that sector for the U.S. as a whole. The series for all industrial sectors were deflated by national price deflators. For some categories of retail sales the deflators used were those relating to the City of Detroit.

The model was employed for making a forecast of Michigan's gross state product in the year 1966.

## 2.6 The Econometric Model of the Province of Nova Scotia

The econometric model of Nova Scotia was designed by Dr. S. Czamanski<sup>13</sup> of the Institute of Public Affairs, Dalhousie University on behalf of the Nova Scotia Voluntary Planning Board. This is the first model constructed for a province in Canada. The purpose of the Nova Scotia model was essentially, to provide an analytical tool for testing alternative policies for long-term regional planning. Unlike the above models, which are crudely specified in terms of sectors, the Nova Scotia model comprehensively covers the various sectors of the provincial economy. Its target variables include welfare indexes which measure the educational, health and economic standards of the people. The model contains the following structural equations:

<sup>10</sup>See H. Thomassen, "A Growth Model for A State", Southern Economic Journal, Vol. XXIV, No. 2 (October, 1957), pp. 123-139.

<sup>11</sup>Econometric Model of Michigan, Technical Report No. 3, Research Seminar in Quantitative Economics, the University of Michigan, (April, 1966).

<sup>12</sup>Ibid, p. 54.

<sup>13</sup>See S. Czamanski, An Econometric Model of Nova Scotia, Halifax: Institute of Public Affairs, Dalhousie University, 1968.



$Y_{(t)} = 7.827 + 0.6497 K_{IS(t)} \\ (4.7040)(6.5531) \\ R^2 = 0.7922 \quad DW = 1.6505$	(2-51)	$F_{m(t)} = 1.869 + 0.0156 X_m \\ (3.0689) \\ R^2 = 0.4022 \quad DW = \text{not given}$	(2-66)
$Y_{(t)} = 2.49 X_{IS(t)} \\ (12.5) \\ R^2 = 0.9176 \quad DW = \text{not given}$	(2-52)	$F_{s(t)} = 0.0835 X_{cs(t)} + 0.3509 \bar{p}_{(t)} \\ (3.7470) \quad (5.4255) \\ R^2 = 0.9285 \quad DW = 1.7623$	(2-67)
$Y_{(t)} = 0.9848 Q_{IS(t)} \\ (752.2053) \\ R^2 = 0.9994 \quad DW = 1.8549$	(2-53)	$i_{p(t)} = -66.060 + 1.5133 NH_{(t)} \\ (27.9972) \\ R^2 = 0.9801 \quad DW = \text{not given}$	(2-68)
$Y_{(t)} = 2.643 + 1.1029 FZ_{(t)} \\ (0.1790)(1.9040) \\ R^2 = 0.1338 \quad DW = 0.2597$	(2-54)	$SIP_{(t)} = -4.022 + 0.0525 W_{(t)} \\ (-1.9578)(12.5468) \\ R^2 = 0.9125 \quad DW = 1.3600$	(2-69)
$Y_{(t)} = -80.696 + 0.4708 P_{u(t)} \\ (-3.6023)(8.4261) \\ R^2 = 0.8333 \quad DW = 0.3193$	(2-55)	$T_{(t)} = -31.933 + 0.0494 Y_{p(t)} + 293.944 t_r(t) \\ (-3.5966)(6.7526) \quad (1.7762) \\ R^2 = 0.9669 \quad DW = 1.8360$	(2-70)
$Y_{(t)} = 24.061 + 0.6741 DF_{s(t)} - 2.0454 t \\ (11.9162)(7.7784) \quad (-7.7027) \\ R^2 = 0.8207 \quad DW = 1.7141$	(2-56)	$C_{1(t)} = -225.407 + 2.1035 H_{(t-1)} + 0.4197 Y_{DP} \\ (-2.3577)(2.6386) \quad (8.3267) \\ R^2 = 0.9966 \quad DW = 2.0583$	(2-71)
$Y_{(t)} = 1.1488 (GI_G + GS_m)_{(t-4)} + 0.0186 Z_{1(t-4)} \\ (2.6590) \quad (1.1821) \\ R^2 = 0.6404 \quad DW = 1.7254$	(2-57)	$C_{4(t)} = -45.236 + 0.1682 Y_{DP} + 0.2461 P_u \\ (17.4463) \quad (3.5707) \\ R^2 = 0.9970 \quad DW = \text{not given}$	(2-72)
$Y_{(t)} = 26.185 + 1.2436 GNP_{(t)} + 0.6672 \frac{C}{(\bar{p}_m - \bar{p}_m)_{(t)}} \quad NS \\ (2.9136)(3.1628) \quad (2.3635) \\ R^2 = 0.3932 \quad DW = 1.9141$	(2-58)	$C_{5(t)} = -66.924 + 0.7370 NH_{(t)} + 0.1291 Y_{DP} \\ (-7.5404)(2.4088) \quad (5.3614) \\ R^2 = 0.9982 \quad DW = 2.1316$	(2-73)
$Y_{(t)} = -239.599 + 1.2005 K_{m(t)} \\ (-10.7214)(19.8214) \\ R^2 = 0.9727 \quad DW = 1.5105$	(2-59)	$T_{c(t)} = 12.624 + 0.0126 GRP_{(t)} \\ (4.6854)(4.0166) \\ R^2 = 0.5022 \quad DW = 1.4026$	(2-74)
$Y_{(t)} = 0.0304 X_{m(t)} + 0.3795 SZ_{(t)} \\ (2.8514) \quad (17.7193) \\ R^2 = 0.6261 \quad DW = 1.3214$	(2-60)	$T_{IN(t)} = -35.363 + 0.2469 Y_E \\ (-5.5414)(29.0736) \\ R^2 = 0.9837 \quad DW = 2.1291$	(2-75)
$Y_{(t)} = -629.923 + 9.2050 E_{4(t)} \\ (-8.0764)(12.2848) \\ R^2 = 0.9448 \quad DW = 1.9770$	(2-61)	$e_{L(t)} = 25.989 + 0.2184 GNP_{(t)} \\ (13.7490)(3.8913) \\ R^2 = 0.4853 \quad DW = 0.9704$	(2-76)
$Y_{(t)} = 0.1079 X_{cs(t)} + 6.2032 i_{(t)} \\ (2.7744) \quad (2.4635) \\ R^2 = 0.8024 \quad DW = 1.6936$	(2-62)	$\log e_{A(t)} = 1.5110 \log F\beta + 0.3954 \log \sum_{t=1}^{-4} GS_{A(t)} \\ (22.5825) \quad (4.5464) \\ R^2 = 0.8114 \quad DW = 1.4292$	(2-77)
$Y_{(t)} = 14.714 + 0.1450 \Delta GRP + 1.6289 GS_{H(t)} \\ (2.5542)(1.8159) \quad (4.2178) \\ R^2 = 0.6099 \quad DW = 1.7120$	(2-63)	$m_{(t)} = 0.3969 Y_{E(t)} + 0.2860 (X_L + X_{IS} + X_m)_{(t)} \\ (12.0557) \quad (4.8400) \\ + 0.337 I_{(t)} + 0.9173 DF_{s(t)} \\ (2.8554) \quad (4.7760) \\ R^2 = 0.9977 \quad DW = 2.8846$	(2-78)
$Y_{(t)} = -2.1494 + 0.7742 \log GRP_{(t)} + 0.6382 \log \bar{p}_{(t)} \quad NS \\ (-1.8830)(8.4429) \quad (1.8587) \\ R^2 = 0.9916 \quad DW = 1.0947$	(2-64)	$M_{(t)} = -3.007 + 0.3718 D^L_{(t-1)} \\ (2.5349) \\ R^2 = 0.3687 \quad DW = \text{not given}$	(2-79)
$Y_{(t)} = -22.245 + 0.0428 A_{L(t)} + 0.5177 FZ_{(t)} \\ (-9.1337)(8.2933) \quad (4.5502) \\ R^2 = 0.9430 \quad DW = 2.0261$	(2-65)		

$$q_{e(t)} = 24.920 + 0.2603 GI_{ED(t)} \quad (2-80)$$

(50.4639) (4.1680)

$R^2 = 0.6208 \quad DW = 2.3583$

$$q_{v(t)} = 220.858 + 17.8200 GI_{v(t)} \quad (2-81)$$

(14.2888) (3.5096)

$R^2 = 0.3947 \quad DW = 0.4443$

#### Endogenous Variables

$X_{Is}$	value added in iron and steel industry
$Q_{Is}$	value of shipments in iron and steel industry
$e_{Is}$	exports of iron and steel
$E_1$	employment in agriculture, forestry and fisheries
$E_4$	employment in commercial services
$E_5$	government employment
$I_m$	investment in manufacturing, including construction industry
$e_m$	exports of manufactured products
$X_m$	value added by manufacturing
$E_3$	employment in manufacturing
$X_{cs}$	value added in commercial services
$I_{cs}$	investment in commercial services
$I_H$	investment in housing
$W$	total wage income
$F_a$	net income of farm operators
$F_m$	net income of unincorporated manufacturing
$F_s$	net income in unincorporated service enterprises
$i_p$	interest, dividends and rental income of persons
$SIP$	contributions to social insurance and government pension plans
$T$	total personal income taxes
$C_1$	consumption of manufactured and agricultural products
$C_4$	consumption of services and travel expenditures
$C_5$	rents and interest payments by households
$T_c$	corporate profit taxes
$T_{IN}$	total indirect taxes
$e_L$	exports of mining products
$e_A$	exports of agricultural, forestry and fishing products
$m$	total imports
$M$	balance of migrations
$q_e$	index of educational standards

$q_v$	index of health standards
$K_{Is}$	total capital invested in iron and steel industry
$Y_p$	total personal income
$Y_{DP}$	total personal disposable income
$GRP$	gross regional product
$Y_E$	total personal expenditures
$I$	total investments
$D^L$	unsatisfied demand for labour
$K_m$	total capital invested in manufacturing
$t_r$	average rate of direct personal taxes

#### Exogenous Variables

$FZ$	number of commercial farms as a proportion of all farms
$P_u$	total urban population
$DF_s$	payments to military personnel
$t$	time
$GI_G$	direct general government investments
$GS_m$	government subsidies and investments in manufacturing
$Z_1$	index of relative accessibility to markets
$GNP$	Canadian gross national product
$C$	price index of manufactured goods in Canada (1949 = 100)
$\bar{P}_m$	price index of manufactured goods in Nova Scotia (1949 = 100)
$NS$	consumer price index for Nova Scotia (1949 = 100)
$\bar{P}$	
$SZ$	index of average size of plant
$i$	rate of interest on loans
$\Delta GRP$	annual change in gross regional product
$GS_H$	government subsidies in housing and commercial services
$A_L$	amount of cultivated land
$NH$	number of housing units constructed after 1920
$H$	number of households
$F\beta$	number of fishing boats
$GS_A$	government subsidies in agriculture, forestry and fisheries
$X_L$	value added by mining
$GI_{ED}$	direct government investments in education and training
$GI_v$	direct government investments in health and welfare



In addition to the above 31 stochastic equations, the Nova Scotia model contains 23 identities, thus explaining a total of 54 endogenous variables of the provincial economic system. The model is also connected with a population and migration sub-model consisting of a system of matrices. The characteristic features of Dr. Czamanski's model are, first non-linearity, in view of the presence of non-linear relationships, such as, (2-64) and (2-77), and secondly, its recursiveness, which justified the use of OLS in estimating the parameters.

The numbers in parentheses below the estimated coefficients in equations (2-51) to (2-81) indicate *t* values. The sample period 1947-65 provides 19 annual observations, hence, the critical values of the *t* statistic at 5 per cent probability level is above 2.00 for 17 degrees of freedom or less. Consequently, any coefficient whose calculated *t* value is less than 2.00 lacks significance, i.e., coefficients in equation (2-54), the coefficient of variable  $Z_1$  in equation (2-57), the coefficient of  $\Delta$ GRP in (2-63) etc. The coefficient of multiple determination (unadjusted) is high for most equations. However, goodness of fit is not satisfactory in equations (2-57), (2-60), (2-63) and (2-80), quite poor in equations (2-54), (2-58), (2-66), (2-74), (2-76), (2-79) and (2-81). The critical values (lower and upper bounds) of the Durbin-Watson *d* statistic are 1.18-1.40 in the case of one independent variable, and 1.08-1.53 for two independent variables. Hence, on the basis of the computed DW values we can detect the presence of positive autocorrelation in relationships (2-54), (2-55), (2-76) and (2-81). Autocorrelation may also exist in (2-59), (2-60), (2-64), (2-69) and (2-77) since the test is inconclusive.

The statistical data used to estimate the Nova Scotia model were either obtained directly from DBS sources or estimated by the Institute of Public Affairs, which was responsible for the development of a set of line and product accounts for the Province. It is interesting to mention the methods employed in the derivation of certain estimated series. The index of educational standards,  $q_e$ , was estimated as a combination of number of classrooms per 1,000 population in the age group 6-20, and the number of high school and college students. The index of living standards,  $q_v$ , was derived by combining three variables, namely, the number of doctors, the number of hospital beds and

the public health expenditures, using the method of principal components.

The capital stock series for manufacturing,  $K_m$ , was derived by using as a benchmark the stock estimate for 1949 available in S. W. Sametz et. al., *The Economic Geography of Canada*, Toronto: Macmillan, 1964. To obtain capital stock estimates for other years, net investment (gross investment less 5 per cent capital depreciation) was added each year to the 1949 stock value. Finally, the estimated capital stock series was adjusted for prices using Canadian price indexes.

The Nova Scotia model has been used to analyse the effects of changes in exogenous variables on the endogenous variables in 1961. This operation, referred to as "sensitivity analysis", consists of doubling the values of one exogenous variable at a time and solving the model for the endogenous variables. The results of this experiment indicated that a one hundred per cent increase in defence spending in Nova Scotia would raise GRP by 21.9 per cent, and total employment by 16.9 per cent, whereas a one hundred per cent increase in Canadian GNP would increase Nova Scotia exports of manufactured goods by 87.4 per cent and exports of mining products by 23.6 per cent.

Another type of test performed on the model was to simulate yearly solutions for the endogenous variables for 1954-61. The discrepancy between the actual and solution values for the endogenous variables was less than ten per cent, and in most cases less than five per cent. Finally, the model was em-

ployed in making *ex post* forecasts within the sample period. The difference between the yearly solutions and forecasts is that in the latter the value of lagged endogenous variables are generated by the model. It was found that the forecasting ability of the model was, on the whole, satisfactory. However, no attempt was made to provide *ex ante* forecasts beyond the observation period.

## 2.7 The Econometric Model of the Province of Prince Edward Island

The model of Prince Edward Island is the most recent of the studies discussed in this Chapter. The project was initiated by Mr. Michael Lane and was completed by Mr. Frank Schwartz<sup>14</sup> under the direction of Mr. Keith Wornell of the Department of Finance, P.E.I. This is, essentially, a policy model designed to provide an in-depth analysis of the P.E.I. economy and to study the effects of alternative program mixes within the framework of the 15-year Development Plan for the Province, initiated in 1969 in collaboration with the Federal Department of Regional Economic Expansion.

The model divides the P.E.I. economy into nine sectors: Agriculture, Fisheries, Construction, Manufacturing, Output, Population, Government, Income and Welfare. The design of the model was based on Tinbergen's targets-instruments approach. It contains 33 stochastic equations and nine identities explaining 42 endogenous provincial variables as follows:

### Stochastic Equations

$$F_A = 55.9397 + 0.6578 P_{AC} + 0.1755 P_{A(t-1)} - 0.0011 Y_{A(t-1)} \quad (2-82)$$

(6.858)      (1.895)      (-2.749)

$$R^2 = 0.9462 \quad DW = 0.9877$$

$$K_A = 126326.47 + 10.6892 CDT_A - 398.058 SQZ_A \quad (2-83)$$

(3.739)      (-5.92)

$$R^2 = .8619 \quad DW = 1.8625$$

$$OP_A = 11966.117 + 0.1366 K_A + 118.1064 \% C_A \quad (2-84)$$

(4.743)      (3.013)

$$R^2 = .8562 \quad DW = 1.3376$$

$$\bar{Y}_A = -776.6976 + 0.1368 VA_A + 10.8355 F_A - 0.0219 K_A + 5.954 P_A \quad (2-85)$$

(10.377)      (2.831)      (-5.808)      (2.629)

$$R^2 = .9629 \quad DW = 1.5821$$

$$K_{FIS} = -13.1177 + 0.6391 K_{FIS(t-1)} + 44.4679 P_{FIS(t-1)} \quad (2-86)$$

(7.954)      (9.364)

$$-0.6533 Y_{UE} - 22.3379 P_{FI}$$

(-4.973)      (-5.265)

$$R^2 = .9328 \quad DW = 1.7190$$

<sup>14</sup>Frank Schwartz, *An Econometric Model of P.E.I., Research Monograph, Department of Finance, P.E.I., Sept. 1970.*

$$E_{FIS} = 3205.6816 - 0.23 K_{FIS(t-1)} - 23.5759 P_{FL} + 30.5421 P_{FIS} \quad (2-87)$$

(− 7.827)      (− 4.038)      (4.781)

$R^2 = .8650 \quad DW = 2.4131$

$$K_{FOS} = 59.8168 + 0.8101 CDT_{FOS} + 51.6463 B_{FOS} \quad (2-88)$$

(7.974)      (8.483)

$$- 32.2706 R_{FOS(t-1)} - 64.6292 C_{FOS(t-1)}$$

(− 4.556)      (− 2.726)

$R^2 = .9820 \quad DW = 2.4278$

$$OP_{FOS} = 45.5082 + 0.3430 K_{FOS} + 15.523 C_{FOS} \quad (2-89)$$

(15.437)      (2.049)

$R^2 = .9589 \quad DW = 1.6366$

$$E_{FOS} = - 17.9909 + 0.0541 OP_{FOS(t-1)} + 0.0124 I_{FOS} \quad (2-90)$$

(9.559)      (5.232)

$$+ 0.2695 P_{FOS(t-1)} + 2.9335 B_{FOS}$$

(3.51)      (11.727)

$R^2 = .9864 \quad DW = 1.8942$

$$R_{FOS} = 2.918 - 0.0096 K_{FOS} + 0.004 CDT_{FOS} + 0.2707 B_{FOS} + 0.35 R_{FOS(t-1)} \quad (2-91)$$

(− 7.923)      (4.82)      (2.308)      (2.555)

$R^2 = .9518 \quad DW = 1.6226$

$$L = 2.3702 + .9223 e_L \quad (2-92)$$

(22.774)

$R^2 = .9622 \quad DW = .7218$

$$OP_{CR} = - 83910.047 + 906.0433 POP - 0.7871 MIG - 1170.3034 \bar{t}(Y_P) \quad (2-93)$$

(6.912)      (− 2.603)      (− 1.795)

$R^2 = .9068 \quad DW = 2.279$

$$OP_{CI} = 1861.82 + 1.7133 PG_{PW} \quad (2-94)$$

(8.179)

$R^2 = .8069 \quad DW = 1.765$

$$VA_{CT} = 4335.4287 + 0.3068 OP_{CT} \quad (2-95)$$

(9.951)

$R^2 = .8684 \quad DW = 1.401$

$$E_C = 2074.2871 + 0.1141 Y_{IR(t-1)} + 0.0735 OP_{CT} - 0.0169 GPP \quad (2-96)$$

(1.821)      (8.984)      (− 3.745)

$R^2 = .8765 \quad DW = 2.289$

$$W_C = 3909.4428 + 0.1823 VA_{CT(t-1)} + 2.6377 E_C + 0.5671 Y_{IR} \quad (2-97)$$

(1.778)      (5.778)      (4.321)

$R^2 = .9400 \quad DW = 1.707$

$$\bar{W}_M = - 10.6525 + 0.4417 \bar{W}_{M(t-1)} + 30.0423 DCPI + 0.00007 GPP \quad (2-98)$$

(3.242)      (2.69)      (3.818)

$R^2 = .9534 \quad DW = 1.6604$

$$W_M^T = - 539.6552 + 0.0207 GPP + 0.2519 VA_{M(t-1)} + 0.2104 I_{M(t-1)} \quad (2-99)$$

(3.445)      (2.903)      (2.441)

$R^2 = .9860 \quad DW = 2.1554$

$$E_M = 2833.8901 + 0.2113 W_M^T + 28.4231 PS1_M - 23.4982 PS2_M \quad (2-100)$$

(12.174)      (3.320)      (− 8.231)

$$- 13.3712 \bar{W}_M$$

(− 3.002)

$R^2 = .9693 \quad DW = 2.0176$

$$OP_M = - 7435.8603 - 17.7621 E_M - 46.2972 ESTB_M + 440.0719 JOWN \quad (2-101)$$

(5.819)      (− 1.756)      (2.136)

$R^2 = .9477 \quad DW = 1.3566$



$$M = -2624.7939 + 0.3671 OP_M \quad (2-102)$$

(18.865)

$$R^2 = .9493 \quad DW = 1.2052$$

$$P = -74353.1564 + 2155.1377 PPR + 0.00332 GNP \quad (2-103)$$

(3.696) (26.131)

$$R^2 = .9822 \quad DW = 1.612$$

$$TR = -12624.3066 + 0.2916 GPP - 0.2325 Y_A \quad (2-104)$$

(17.285) (-1.964)

$$R^2 = .9573 \quad DW = .8511$$

$$TEX = 1323.0583 + 1.0979 PG_{TR} \quad (2-105)$$

(31.572)

$$R^2 = .9793 \quad DW = 2.0657$$

$$R = 6032.2216 + 0.4957 PG_{TR} + 578.5051 T - 0.0848 GPP \quad (2-106)$$

(7.153) (5.196) (-2.873)

$$R^2 = .9858 \quad DW = 2.194$$

$$= 106.8081 + 0.3181 W_G + 12.765 T - 0.0123 PG_{TEX} \quad (2-107)$$

(17.924) (1.909) (-2.983)

$$R^2 = .9718 \quad DW = 1.5307$$

$$A = -3667.6738 + 0.0002388 GNP \quad (2-108)$$

(17.024)

$$R^2 = .9324 \quad DW = .768$$

$$= -1413.1169 + 0.6096 Y_{IR(t-1)} + 0.0303 GPP \quad (2-109)$$

(7.153) (5.196) (-2.873)

$$R^2 = .9014 \quad DW = 1.898$$

$$= -9765.6484 + 0.2543 GPP + 2.986 VA_M \quad (2-110)$$

(2.5551) (2.434)

$$R^2 = .9745 \quad DW = 0.985$$

$$CN = -0.2454 + 0.0007 PG_{ED} + 0.0148 \bar{Y}_P \quad (2-111)$$

(2.666) (4.460)

$$R^2 = .9667 \quad DW = 1.1691$$

$$TH = -660.7316 + 0.0272 POP_u + 0.0219 PG_{HLTH} + 0.7546 HB \quad (2-112)$$

(4.483) (3.229) (8.95)

$$R^2 = .9945 \quad DW = 1.2218$$

$$NG = -1414.0637 + 2.7513 STRT_{(t-1)} + 14.9055 \bar{Y}_P + 2.9027 STRT \quad (2-113)$$

(1.431) (7.395) (1.662)

$$R^2 = .9189 \quad DW = 1.8142$$

$$FR = -671.5286 + 0.4967 JHSNG + 0.5085 \bar{Y}_P + 0.0336 POP_u \quad (2-114)$$

(112.823) (8.97) (4.895)

$$R^2 = .9999 \quad DW = 1.4008$$

ities

$$= \bar{Y}_A (\# F) \quad (2-115)$$

$$OP_{CT} = OP_{CR} + OP_{CI} + OP_{CC} \quad (2-120)$$

$$= K_{FOS} - K_{FOS(t-1)} \quad (2-116)$$

$$OP_{CP} = OP_A + OP_{FIS} + OP_{FOS} + OP_{CT} + OP_M \quad (2-121)$$

$$= POP_{(t-1)} + NI(POP_{t-1}) \quad (2-117)$$

$$Y_P = Y_A + Y_{IR} + WSS + Y_{NUB} + G_{NFR} + MPA \quad (2-122)$$

$$PPR(e_{POP}) \quad (2-118)$$

$$\bar{Y}_P = Y_P / POP \quad (2-123)$$

$$= e_{POP} - MIG \quad (2-119)$$

Endogenous Variables

$F_A$	average farm size, agriculture
$K_A$	capital stock, agriculture
$OP_A$	output, agriculture
$\bar{Y}_A$	net income per farm, agriculture
$Y_A$	total net income, agriculture
$K_{FIS}$	capital stock, inshore fishery
$E_{FIS}$	employment, inshore fishery
$K_{FOS}$	capital stock, offshore fishery
$I_{FOS}$	net investment, offshore fishery
$OP_{FOS}$	output, offshore fishery
$E_{FOS}$	employment, offshore fishery
$R_{FOS}$	profitability, offshore fishery
GPP	gross provincial product (P.E.I.)
$e_{POP}$	expected population
$c_L$	expected labour force
$L$	actual labour force
POP	actual population
$Y_{IR}$	net rental and interest income of persons
$OP_{CR}$	output, residential construction
$OP_{CI}$	output, institutional construction
$OP_{CT}$	output, total construction
$VA_{CT}$	value added, total construction
$E_C$	employment, construction
$W_C$	total annual wage bill, construction
$\bar{W}_M$	average weekly wages and salaries, manufacturing
$W_M^T$	total annual wage bill, manufacturing
$E_M$	employment, manufacturing
$OP_M$	output, manufacturing
$VA_M$	value added, manufacturing
$PG_{TR}$	provincial government, total revenues
$PG_{TEX}$	provincial government, total expenditures
$G_{NFR}$	government transfers to persons
$E_{PG}$	employment, provincial government
MPA	military pay and allowances
WSS	wages, salaries and supplementary labour income
$Y_P$	total personal income
$\bar{Y}_P$	personal income per person
$OP_{CT}$	output, total construction
JEDCN	index of education

JHSNG	index of housing standards
JHLTH	index of health services
JWLFR	index of general well-being

Exogenous Variables

$PA_C$	cost price index, agriculture
$PA$	product price index, agriculture
$CDT_A$	credit used, agriculture
$SQZ_A$	price/cost squeeze, agriculture
$\%C_A$	proportion of commercial farms, agriculture
$POP_u$	urban population
$VA_A$	value added, agriculture
$P_{FIS}$	fish price index, inshore fishery
$Y_{UE}$	income from unemployment insurance payments
$P_{FL}$	fish price index, lobsters
$CDT_{FOS}$	credit used, offshore fishery
$B_{FOS}$	boats fishing, offshore fishery
$C_{FOS}$	boats constructed, offshore fishery
$P_{FOS}$	fish price index, offshore fishery
PPR	population participation rate
GNP	Canadian gross national product
NI	rate of natural increase of population (births minus deaths)
MIG	migrations from P.E.I.
$\bar{t}(Y_P)$	average personal income tax rate
$PG_{PW}$	total provincial government expenditures on public works
$OP_{CC}$	output, commercial construction
$I_M$	net investment, manufacturing
$PS1_M$	plant size indicator 1, manufacturing
$PS2_M$	plant size indicator 2, manufacturing
$ESTB_M$	number of establishments, manufacturing
JOWN	index of ownership, manufacturing
T	time
$W_G$	total annual wage bill, government
$PG_{ED}$	provincial government expenditures on education (ordinary plus capital)
$PG_{HLTH}$	provincial government total expenditures on health (ordinary plus capital)
HB	number of hospital beds
STRT	number of housing starts
#F	number of farms, agriculture, thousands of units
$OP_{FIS}$	output, inshore fishery
$Y_{NUB}$	net income of non-farm unincorporated business



Due to the recursiveness of the model all equations were estimated by ordinary least-squares on the basis of annual data for the period 1946-68. Some of the equations were reduced to a shorter period ranging between 10 and 23 observations.

The statistical results of the model are very satisfactory. The values of the coefficient of multiple determination (unadjusted) are quite high in every case explaining not less than 80 per cent and in most equations more than 90 per cent of the variation of the dependent variables. Most of the estimated coefficients are statistically significant as suggested by the calculated *t*-values given beneath the coefficients in parentheses. The computed values of the Durbin-Watson statistic indicate that in about 22 of the estimated equations the residuals are free from serial correlation.

The statistical data used to estimate the P.E.I. model were obtained directly from Statistics Canada sources or compiled by the Provincial Department of Finance which has undertaken the development of a comprehensive system of regional economic accounts. As in the case of Nova Scotia, the principal composite method was employed to obtain the composite indexes of education, health services, housing standards. All variables measured in dollars were deflated using specific composite indexes for agriculture and fisheries, available from DBS statistics, and a general composite index for the other sectors corresponding to the average of Halifax and St. John's (B.C.) consumer price indexes.

The P.E.I. model was subjected to the same type of sensitivity analysis as the model for Nova Scotia. This analysis indicated the dependence of the province on the national economy and the importance of provincial government expenditures on the overall performance of the P.E.I. economy. It was found that a doubling of provincial government outlays on public works would raise the output of the construction industry by 42.4 per cent, employment in the same industry by 4.6 per cent, and the industry's wage bill by 17.8 per cent. Since the model was designed to be used for policy analysis no attempt was made to assess its forecasting ability or to make *ex ante* forecasts beyond the sample period.

### Common Characteristics of Regional Models

The empirical studies discussed in this paper indicate the progress made in the

field of econometric model building at the provincial or state level, from 1957 when the Georgia model was published until recent years.

The model of Georgia is the simplest and the most crudely specified in terms of sectors, focusing on employment and ignoring other important sectors of the state economy. The Massachusetts model, published ten years later, is also centred on the employment sector, but there are three additional sectors for consumers, investment and exports. The defect of the model is that it does not contain any policy variables which can be controlled by the state government. In the Michigan model most of the state endogenous variables are directly correlated with national variables taken as exogenous without any *a priori* justification for specifying the equations in this particular manner. The model of Ohio is the only one specified in a way that resembles more closely the national models of the Klein-Goldberger type. The two Canadian models of Nova Scotia and P.E.I. are more comprehensive, relative to the state models, incorporating a greater number of sectors and placing emphasis on policy analysis rather than forecasting.

These models share some common features worth mentioning. First the monetary sector is entirely missing in every case. Secondly, although the models attempt to approximate open economies, the trade sector is either non-existent or specified in a manner that treats the national economy as the rest of the world. Finally, all models point to the severe data constraints existing at the sub-national level, and the need for developing a reliable data base required for their estimation.

## III SPECIFICATION OF THE ONTARIO ECONOMETRIC MODEL

### 3.1 The Purpose of the Ontario Model

The recently published Ontario interindustry model<sup>1</sup> and the Ontario economic accounts<sup>2</sup> mark the completion of two major projects of quantitative economic analysis initiated by the Economic Analysis Branch of the Economic and Statistical Services Division. The provincial accounts contain estimates of gross provincial product, personal consumption expenditures, business investment, government revenue and similar indicators of economic

activity for the period 1957-68. Such estimates, although useful in describing the movements of key economic variables over time, are quite inadequate in analysing the Ontario economic system for two reasons.

In the first place, the estimates in the accounts are highly aggregated and, thus, fail to reveal detailed information about the transactions among producers and other economic units. To obtain this information, the Economic Analysis Branch has constructed an input-output table for the province, which records in thousands of 1965 dollars the flow of goods and services among 140 Ontario industries in that year. The input-output technique is a powerful tool of analysis because it makes it possible to penetrate below the surface of aggregate statistics, available in the accounts, and study the complicated internal pattern of transactions between industries and other major sectors of the economy.

Secondly, the set of economic accounts is merely an historical record of economic events. It provides no explanation of the movements of economic variables or the interaction of interrelated variables in the economic system. It is the task of the econometric model to explain such phenomena. The Ontario econometric model links together the provincial economic accounts and the input-output table into an integrated and complete program of quantitative analytical techniques for policy simulation and forecasting.

The econometric model will primarily be used for three purposes. Its first use will be to provide forecast estimates of government expenditures, personal consumption, business investment and other components of final demand required for the input-output model. The second use of the model will be for making short-term forecasts of endogenous variables determined within the system on the basis of certain assumptions regarding the rate of growth of exogenous variables, which are determined outside the system. The last and perhaps most important use of the model, from the point of view of government, will be in evaluating alternative economic policies.

Policy analysis is facilitated by using a computer routine to calculate the policy or impact multipliers of the model, which measure the effects of changes in a policy variable on all dependent variables in the system. Once the policy multipliers have been computed it is possible to analyse the fiscal effects

<sup>1</sup>See R. H. Frank, S. M. Batrik and D. Haronitis, "The Input-Output Structure of the Ontario Economy", Ontario Economic Review, Vol. 8, No. 1 (January/February 1970).

<sup>2</sup>M. V. Chari and R. H. Frank, "The Development of Ontario Economic Accounts", Ontario Economic Review, Vol. 8, No. 6 (November/December 1970).

of changes in tax rates or the effects of changes in government expenditure or any desired combination of policies, eg., an increase in government expenditure combined with a simultaneous increase in taxes. By simulating the model in the computer, policy makers will be able to explore a large number of alternative policies for optimal decision-making.

3.2 The Sectors of the Ontario Model

In developing the econometric model much attention was given to the structure and conceptual framework of the provincial economic accounts. In fact, it can be said that the model was designed for the purpose of explaining significant economic variables which appear in the accounts, such as personal consumption expenditure, business investment, wages and salaries, corporate profits, the various components of government revenue, etc. An equation has been specified for each of these variables, which embodies a testable hypothesis about the causal relationship between the variable in question and some other variables.

The Ontario econometric model consists of four blocks of equations which correspond to the four sectors of provincial accounts; persons, businessmen, government and non-residents. Each sector contains a number of equations explaining various components.

The equations of the model are shown explicitly in the next Section. The symbol  $\Delta$  denotes the change of a variable in two successive periods of time, i.e., for any variable  $X_t$  at time period  $t$ ,  $\Delta X_t = X_t - X_{t-1}$ . The Greek letters  $\alpha$ ,  $\beta$  and  $\gamma$  denote parameters to be estimated.  $\alpha_i$  represents the constant term in the  $i$ th equation;  $\beta_i$  are the coefficients of endogenous variables;  $\gamma_i$  denote the coefficients of predetermined variables; and  $u_i$  is the stochastic term in the  $i$ th equation. The obvious advantage of this parameter notation is that looking at the equations one can spot at a glance which variables are endogenous and which are predetermined in the model. All equations are linear in variables and parameters. For notational convenience the time subscript  $t$  is omitted from all variables. Accordingly, current variables denoted, for example, as  $X$ ,  $Y$ ,  $Z$  should be read as  $X_t$ ,  $Y_t$ ,  $Z_t$ , and lagged variables denoted as  $(X)_{-1}$ ,  $(X)_{-2}$ ,  $(Y)_{-1}$  should be read as  $X_{t-1}$ ,  $X_{t-2}$ ,  $Y_{t-1}$  etc. The names of variables are listed in Section 3.4.

PERSONAL SECTOR

- Wages, salaries and supplementary labour income
- Interest, dividends and miscellaneous investment income of persons
- Net income of farm operators from farm production
- Changes in farm inventories
- Net income of non-farm unincorporated business
- Personal expenditure on consumer goods and services

BUSINESS SECTOR

- Gross private domestic investment in machinery and equipment
- Gross private domestic investment in residential and non-residential construction
- Changes in non-farm business inventories
- Corporate profits and inventory valuation adjustment
- Corporate dividend payments

GOVERNMENT SECTOR

- Employer and employee contributions to social insurance and government pension funds
- Personal income taxes
- Taxable returns of individuals
- Personal income assessed
- Personal tax exemptions and deductions
- Corporate profit taxes
- Taxable income of corporations
- Hospital insurance premiums
- Motor vehicle licences and permits
- Gasoline taxes
- Retail sales taxes
- Profits of liquor commissions
- Other indirect taxes
- Government investment income

NON-RESIDENTS SECTOR

- Imports of goods and services from rest of the world
- Exports of goods and services to rest of the world

Number of stochastic equations

Number of identities

Total number of equations

Number of current endogenous variables

Number of predetermined variables

Lagged endogenous

Exogenous

Total number of variables

Number of  $\alpha$  parameters

Number of  $\beta$  parameters

Number of  $\gamma$  parameters

Total number of parameters

Number  
Equatio

6

5

14

2

27

20

47

47

34

6

28

81

11

14

29

54



### 3 Equations of the Ontario Model

#### EQUATIONS EXPLAINING COMPONENTS OF GROSS PROVINCIAL PRODUCT

Personal expenditure on consumer goods and services

$$C_p = \beta_1 Y_d + \gamma_1 (C_p)_{-1} + u_1 \quad (3-1)$$

Gross private domestic investment in machinery and equipment

$$I_m = \gamma_2 (I_m)_{-1} + \gamma_3 (P_c)_{-1} + \gamma_4 \Delta GPP + u_2 \quad (3-2)$$

Gross private domestic investment in residential and non-residential construction

$$I_c = \beta_2 I_m + \gamma_5 (M_a)_{-1} + \gamma_6 (I_c)_{-1} + u_3 \quad (3-3)$$

Change in non-farm business inventories

$$\Delta I_b = \gamma_7 (P_c)_{-1} + \gamma_8 \Delta S_f + \gamma_9 \Delta C_p + u_4 \quad (3-4)$$

Change in farm inventories

$$\Delta I_f = \alpha_5 + \gamma_{10} P_f + \gamma_{11} X_f + \gamma_{12} (I_f)_{-1} + u_5 \quad (3-5)$$

Exports of goods and services to rest of the world

$$E_w = \alpha_6 + \gamma_{13} Y_{us} + u_6 \quad (3-6)$$

Imports of goods and services from rest of the world

$$M_w = \beta_3 GPP + \gamma_{14} (C_p)_{-1} + u_7 \quad (3-7)$$

#### EQUATIONS EXPLAINING COMPONENTS OF PERSONAL INCOME

Wages, salaries and supplementary labour income

$$Y_w = \alpha_8 + \beta_4 GPP + \gamma_{15} L_p + u_8 \quad (3-8)$$

Income of non-farm unincorporated business

$$Y_b = \alpha_9 + \gamma_{16} (GPP - \Delta I_f) + u_9 \quad (3-9)$$

Income of farm operators from farm production

$$Y_f = \gamma_{17} \Delta X_f + \gamma_{18} P_f + u_{10} \quad (3-10)$$

Interest, dividends and miscellaneous investment income of persons

$$Y_1 = \alpha_{11} + \gamma_{19} [S_p + (S_p)_{-1}] + u_{11} \quad (3-11)$$

#### EQUATIONS EXPLAINING CORPORATE PROFITS AND DIVIDENDS

Corporate profits and inventory valuation adjustment

$$P_c = \beta_5 GPP + \beta_6 \Delta I_b + u_{12} \quad (3-12)$$

Corporate dividend payments

$$D_v = \gamma_{20} (D_v)_{-1} + \gamma_{21} [P_c - (T_c + Z_x)] + u_{13} \quad (3-13)$$

#### EQUATIONS EXPLAINING COMPONENTS OF PROVINCIAL GOVERNMENT REVENUE

Employer and employee contributions to social insurance and government pension funds

$$C_g = \beta_7 Y_w = u_{14} \quad (3-14)$$

Personal income taxes

$$T_p = \beta_8 T_p^* + u_{15} \quad (3-15)$$

Personal income assessed

$$Y_a = \alpha_{16} + \gamma_{22} (Y_p)_{-1} + u_{16} \quad (3-16)$$

Personal tax exemptions and deductions

$$T_x = \beta_9 N_r + \gamma_{23} t + u_{17} \quad (3-17)$$

Taxable returns of individuals

$$N_r = \gamma_{24} (L_e)_{-1} + \gamma_{25} t + u_{18} \quad (3-18)$$

Corporate direct taxes

$$T_c = \beta_{10} T_c^* + u_{19} \quad (3-19)$$

Corporate taxable income

$$Y_c = \alpha_{20} + \gamma_{26} (P_c)_{-1} + u_{20} \quad (3-20)$$

Gasoline taxes

$$T_g = \beta_{11} T_g^* + u_{21} \quad (3-21)$$

Retail sales taxes

$$T_s = \beta_{12} T_s^* + u_{22} \quad (3-22)$$

Hospital insurance premiums

$$H_i = \beta_{13} H_i^* + u_{23} \quad (3-23)$$

Motor vehicle licences and permits

$$V_m = \alpha_{24} + \gamma_{27} V_r + u_{24} \quad (3-24)$$

Profits of liquor commissions

$$P_b = \alpha_{25} + \gamma_{28} \bar{Y}_p + u_{25} \quad (3-25)$$

Other indirect taxes

$$T_o = \alpha_{26} + \beta_{14} C_p + u_{26} \quad (3-26)$$

Government investment income

$$Y_g = \alpha_{27} + \gamma_{29} G_p + u_{27} \quad (3-27)$$

#### DEFINITIONAL IDENTITIES

Gross provincial product

$$GPP = C_p + I_m + I_c + \Delta I_b + \Delta I_f + E_w - M_w + G_p + G_m + G_h \quad (3-28)$$

Personal income

$$Y_p = Y_w + Y_b + Y_f + Y_1 + Z_p + A \quad (3-29)$$

Disposable personal income

$$Y_d = Y_p - (T_p + C_s + Z_g) \quad (3-30)$$

Saving of persons and unincorporated business

$$S_p = Y_d - (C_p + Z_c) \quad (3-31)$$

Retained profits of corporations

$$S_c = P_c - (T_c + D_v + Z_x) \quad (3-32)$$

Personal income tax accruals

$$T_p^* = R_p (B_a) \quad (3-33)$$

Personal basic tax accruals

$$B_a = \sum_{i=1}^4 (W_r)_i [(Y_a)_i - (N_r)_i (\bar{T}_x)_i] - R_v (D_o) \quad (3-34)$$

Weighted average basic tax rate

$$(W_r)_i = \sum_{j=1}^n [(T_b)_{ji} / (\bar{Y}_t)_{ji}] [(Y_a)_{ji} / (Y_a)_i] \quad (3-35)$$

Personal income assessed in the first income class

$$(Y_a)_1 = Y_a - \sum_{i=2}^4 (Y_a)_i \quad (3-36)$$

Personal income assessed in the  $i$ th income class

$$(Y_a)_i = (P_y)_i (Y_a) \quad i = 2, \dots, 4 \quad (3-37)$$

Tax exemptions and deductions in the first income class

$$(T_x)_1 = T_x - \sum_{i=2}^4 (T_x)_i \quad (3-38)$$

Tax exemptions and deductions in the  $i$ th income class

$$(T_x)_i = (P_x)_i (T_x) \quad i = 2, \dots, 4 \quad (3-39)$$

Taxable returns in the first income class

$$(N_r)_1 = N_r - \sum_{i=2}^4 (N_r)_i \quad (3-40)$$

Taxable returns in the  $i$ th income class

$$(N_r)_i = (P_r)_i (N_r) \quad i = 2, \dots, 4 \quad (3-41)$$

Computed corporate direct taxes

$$T_c^* = R_c (Y_c) \quad (3-42)$$

Computed hospital insurance premiums

$$H_i^* = R_h (L_t) \quad (3-43)$$

Weighted average hospital insurance rate

$$R_h = 12 [R_{hm} (L_m/L_t) + R_{hs} (L_s/L_t)] \quad (3-44)$$

Computed gasoline taxes

$$T_g^* = R_g (F_g) + R_d (F_d) \quad (3-45)$$

Computed retail sales taxes

$$T_s^* = R_s (S_r) \quad (3-46)$$

Provincial government revenue

$$PGR = C_s + T_p + T_c + T_g + T_s + T_o + V_m + P_b + H_i + Y_g + Z_w \quad (3-47)$$

### 3.4 List of variables

#### CURRENT ENDOGENOUS VARIABLES

$B_a$	personal basic tax accruals — Ontario taxpayers, calculated values, millions of dollars
$C_p$	personal expenditure on consumer goods and services, millions of dollars
$C_s$	employer and employee contributions to social insurance and government pension funds — provincial, millions of dollars
$D_v$	total dividend payments of Ontario corporations, millions of dollars
$\Delta I_b$	change in non-farm business inventories, millions of dollars
$\Delta I_f$	change in farm inventories, millions of dollars
$E_w$	Ontario exports of goods and services to rest of the world, millions of dollars
GPP	gross provincial product, millions of dollars
$H_i$	hospital insurance premiums as per provincial economic accounts, millions of dollars
$H_i^*$	hospital insurance premiums, calculated values, millions of dollars
$I_c$	gross private domestic investment in residential and non-residential construction, millions of dollars
$I_m$	gross private domestic investment in machinery and equipment, millions of dollars
$M_w$	Ontario imports of goods and services from rest of the world, millions of dollars
$N_r$	total number of taxable returns of individuals in Ontario, thousands of units
$(N_r)_1$	taxable returns of individuals in the first income class, thousands of units
$(N_r)_i$	taxable returns of individuals in the $i$ th income class, thousands of units
$P_c$	profits before taxes and after inventory valuation adjustments of Ontario corporations, millions of dollars
$P_b$	profits of liquor commissions, millions of dollars
PGR	total provincial government revenue, millions of dollars
$R_h$	weighted average hospital insurance annual rate, calculated values
$S_c$	retained profits of Ontario corporations, millions of dollars
$S_p$	saving of Ontario persons and unincorporated businesses, millions of dollars
$T_c$	corporate direct taxes — provincial, as per provincial economic accounts, millions of dollars



* corporate direct taxes — provincial, calculated values, millions of dollars
gasoline taxes as per provincial economic accounts, millions of dollars
gasoline taxes, calculated values, millions of dollars
other indirect taxes as per provincial economic accounts, millions of dollars
personal income tax collections — provincial, as per provincial economic accounts, millions of dollars
personal income tax accruals — provincial, calculated values, millions of dollars
retail sales taxes as per provincial accounts, millions of dollars
retail sales taxes, calculated values, millions of dollars
total personal tax exemptions and deductions — Ontario taxpayers, as per <i>Taxation Statistics</i> <sup>3</sup> , millions of dollars
1 personal tax exemptions and deductions in the first income class, thousands of dollars
1 personal tax exemptions and deductions in the $i$ th income class ( $i = 2, \dots, 4$ ), thousands of dollars
motor vehicle licences and permits — persons and business, as per provincial economic accounts, millions of dollars
1 weighted average basic tax rate in the $i$ th income class, calculated values
total personal income assessed — Ontario taxpayers, as per <i>Taxation Statistics</i> , millions of dollars
1 personal income assessed in the first income class, millions of dollars
1 personal income assessed in the $i$ th income class ( $i = 2, \dots, 4$ ), millions of dollars
net income of non-farm unincorporated business, millions of dollars
taxable income of Ontario corporations, millions of dollars
personal disposable income, millions of dollars
net income of farm operators from farm production, millions of dollars
government investment income — provincial, millions of dollars
interest, dividends and miscellaneous investment income of persons, millions of dollars
personal income, millions of dollars
wages, salaries and supplementary labour income, millions of dollars

# PREDETERMINED VARIABLES

A	military pay and allowances, millions of dollars
$(C_p)_{-1}$	personal expenditure on consumer goods and services, lagged one year
$D_o$	dividends paid to Ontario persons by all Canadian corporations, millions of dollars
$\Delta C_p$	change in personal expenditure on consumer goods and services
$\Delta GPP$	annual change in gross provincial product
$\Delta S_t$	change in selling value of factory shipments, total Ontario manufacturing, millions of dollars
$\Delta X_t$	change in gross value of Ontario agricultural production, millions of dollars
$F_d$	net taxable sales of diesel fuel in Ontario, thousands of gallons
$F_g$	net taxable sales of gasoline fuel in Ontario, thousands of gallons
$G_h$	total expenditure of Ontario hospitals, millions of dollars
$G_m$	total municipal government expenditure, millions of dollars
$G_p$	total provincial government expenditure, millions of dollars
$I_t$	level of inventories, millions of dollars
$L_e$	labour employed in Ontario, thousands of persons
$L_t$	labour force in Ontario, thousands of persons
$L_p$	proportion of labour force employed in Ontario
$L_m/L_t$	proportion of married males in the labour force, per cent
$L_s/L_t$	proportion of single persons in the labour force, per cent
$(M_a)_{-1}$	number of marriages in Ontario lagged one year
$NP_e$	profits before taxes of Canadian corporations
$(P_c)_{-1}$	corporate profits lagged one year
$P_t$	index of average farm prices of agricultural products in Ontario (1961 = 100)
$(P_r)_i$	proportion $(N_r)_i/N_r$ of taxable returns in the $i$ th income class, per cent
$(P_x)_i$	proportion $(T_x)_i/T_x$ of tax exemptions and deductions in the $i$ th income class, per cent
$(P_y)_i$	proportion $(Y_a)_i/Y_a$ of personal income assessed in the $i$ th income class, per cent
$R_c$	provincial corporate tax rate, per cent
$R_d$	tax rate of diesel fuel per gallon

$R_g$	tax rate of gasoline fuel per gallon	$(Y_a)_{ji}$	personal income assessed in income group $j$ , class $i$ , millions of dollars
$R_{hm}$	monthly hospital premium for married contributors	$\bar{Y}_p$	personal income per capita
$R_{hs}$	monthly hospital premium for single persons	$(Y_p)_{-1}$	personal income lagged one year
$R_p$	provincial personal income tax rate, per cent	$(\bar{Y}_t)_{ji}$	average taxable income in the $j$ th group of the $i$ th income class
$R_s$	rate of retail sales tax, per cent	$Y_{us}$	gross national product of the United States, billions of U.S. dollars
$R_v$	rate of dividend tax credit, per cent	$Z_c$	transfers by persons to corporations and non-residents abroad (interest on consumer debt plus personal remittances abroad), millions of dollars
$(S_p)_{-1}$	saving of persons and unincorporated business, lagged one year	$Z_g$	transfers by persons to government (other current transfers to Ontario government plus transfers to federal government), millions of dollars
$S_r$	retail sales in Ontario, millions of dollars	$Z_p$	transfers to personal sector from all sources, millions of dollars
$t$	time trend measured in years	$Z_x$	transfers by corporations (charitable contributions and tax debts plus corporation income tax liabilities to federal government), millions of dollars
$(T_b)_{ji}$	basic personal tax payable on average taxable income, income group $j$ , class $i$ , calculated values	$Z_w$	transfers to provincial government by federal government, millions of dollars
$(\bar{T}_x)_i$	average tax exemptions and deductions in the $i$ th income class, calculated values		
$V_r$	total number of registered motor vehicles (all types) in Ontario, thousands of units		
$X_t$	gross value of agricultural production in Ontario, millions of dollars		

### 3.5 The Consumption Function

The consumption function of the model is based on the theory developed by R. J. Ball and P. S. Drake<sup>4</sup>. This theory postulates that the utility function for a given individual depends on his current rate of consumption and his current stock of wealth or net worth, measured in terms of consumption goods.

Thus,

$$u_{it} = F_i(W_{it}, C_{it})$$

where  $u_{it}$  denotes the utility of the  $i$ th individual at time  $t$ ,  $W_{it}$  is his stock of wealth and  $C_{it}$  represents the volume of consumption goods. The function  $F_i$  is assumed to be linear and homogeneous of degree one. On this assumption, the problem for the  $i$ th individual is to maximize his utility  $u_i$  subject to the budget constraint.

$$Y_{it} = C_{it} + W_{it} - W_{it-1}$$

where  $Y_{it}$  denotes the income of the  $i$ th individual at time  $t$ .

The authors assume further that the wealth-consumption ratio for the  $i$ th individual is constant over time, so that the individual relation between wealth and consumption is of the form

$$W_{it} = k_i C_{it}$$

where the  $k_i$  are assumed to be fixed for each individual. This assumption becomes necessary if one attempts to derive an aggregate consumption function from the individual utility functions.

Aggregation of the above wealth-consumption relation gives

$$W_t = C_t \sum w_{it} k_i \\ = k C_t$$

where

$$W_t = \sum W_{it}, C_t = \sum C_{it}, \\ \text{and } w_{it} = C_{it}/C_t.$$

The coefficient  $k$  can be treated as a parameter if the weights  $w_i$  are independent of time. As the authors suggest, the result of shifting from the micro to the macro relation is to introduce an aggregation bias if the macro variables are treated as simple sums of the micro variables. Aggregating the budget constraint we can write

$$Y_t = C_t + W_t - W_{t-1}$$

which combined with  $W_t = k C_t$  yields

$$C_t = \frac{1}{1+k} Y_t + \frac{k}{1+k} C_{t-1} \\ = (1-\alpha) Y_t + \alpha C_{t-1}$$

where  $\alpha = \frac{k}{1+k}$ . This is the final version of

the Ball-Drake aggregate consumption function, and incorporates the restriction that coefficients sum to unity. This function is the same as the consumption function of the Ontario model

$$C_p = \beta_1 Y_d + \gamma_1 (C_p)_{-1} + u_1 \quad (3)$$

with the *a priori* restriction  $\beta_1 + \gamma_1 = 1$ . Whether this restriction is satisfied is a matter of empirical testing. If in the estimated consumption equation  $\beta_1 + \gamma_1 \neq 1$ , our consumption hypothesis can still find support in the following model developed by Klein<sup>5</sup>

$$C_t = \alpha \sum_{i=0}^{\infty} \beta^i Y_{t-i} \quad 0 < \beta < 1$$

which is a distributed lag scheme with the coefficients decreasing geometrically. Extending the summation on the right-hand side and obtaining

$$C_t = \alpha Y_t + \alpha \beta Y_{t-1} + \alpha \beta^2 Y_{t-2} + \dots$$

which lagged for one period, and multiplying by  $\beta$  gives

$$\beta C_{t-1} = \alpha \beta Y_{t-1} + \alpha \beta^2 Y_{t-2} + \dots$$

Finally, subtracting the second equation from the first yields

$$C_t = \alpha Y_t + \beta C_{t-1}$$

<sup>4</sup>R. J. Ball and P. S. Drake, "The Relationship Between Aggregate Consumption and Wealth", *International Economic Review*, Vol. 5, No. 1, (January 1964).

<sup>5</sup>L. R. Klein, "The Friedman-Becker Illusion", *Journal of Political Economy*, LXVI (December, 1958).



his has the same form as the Ball-Drake function without any restrictions on the parameter  $\alpha$ .

## 6 The Investment Functions

reflecting the fact that a capital stock series for Ontario is not available, the investment functions of the Ontario model could not be specified on the basis of those investment theories which use capital stock as an explanatory variable. Hence, neither the capital stock adjustment principle nor the neoclassical theory of investment could be employed in formulating the investment equations of the model. Accordingly, the investment behaviour of Ontario businessmen explained by some naive hypotheses, such as the crude accelerator theory which postulates that investment is determined by the rate of change of output, the profit theory which states that business investment is a function of profits, and other simple models. Thus, new investment in machinery and equipment,  $I_m$ , is explained by past profits,  $(P_c)_{-1}$ , year to year changes in gross provincial product,  $\Delta GPP$ , and last year's investment,  $(I_m)_{-1}$ .

$$I_m = \gamma_2 (I_m)_{-1} + \gamma_3 (P_c)_{-1} + \gamma_4 \Delta GPP + u_2 \quad (3-2)$$

profit variable serves both as a measure of business firms' liquidity and of expectations, whereas the income variable is an indicator of economic activity. The one year lag between the explanatory variables and the dependent variable is justified on the assumption that businessmen plan their investment expenditure one year ahead. This assumption is quite plausible in view of the fact that business firms normally base their decision on the financial statements prepared the previous fiscal year and that the lag between investment decisions and realizations consists of the following components:

The time that elapses between the decision to invest and the decision to order the required capital goods.

There may be a waiting lag from the time the capital goods have been ordered until work on them begins by the capital goods industries, particularly if the industries are working near full capacity.

The production lag, i.e., the time required by the capital goods industries to produce the goods on order.

Finally, there is a delivery lag which may involve a time interval of three or more

months in the event that the goods have to be imported from abroad.

Investment in construction is the sum of two components; investment in residential and non-residential construction. Since separate statistical data on each component are not available, one equation explains both parts of investment

$$I_c = \beta_2 I_m + \gamma_5 (M_a)_{-1} + \gamma_6 (I_c)_{-1} + u_3 \quad (3-3)$$

The explanatory variables in this equation reflect the fact that the dependent variable incorporates two different components of business investment. Thus, the first explanatory variable,  $I_m$ , was introduced to explain that part of  $I_c$  which relates to non-residential construction. The underlying hypothesis is that in a growing economy, such as Ontario, only a small part of  $I_m$  represents replacement investment, while the greater part constitutes an addition to the existing stock of machinery and equipment, which necessitates more space. Hence, when businessmen decide to invest in new machinery and equipment at the same time they make provision for additional building space required for the installation and operation of new machines.

The second explanatory variable,  $M_a$ , in equation (3-3) denoting family formation in Ontario, attempts to capture that part of  $I_c$  which corresponds to residential construction. The determinants of investment in residential construction include not only demographic variables but also other important factors, such as, income, construction costs, rents, vacancy rates, availability of mortgage funds, mortgage interest rates, etc. However, from a long-run point of view the demand for housing may be regarded as the difference between the stock of dwelling units and the number of families. Accordingly, the number of new families was chosen as the most appropriate variable in equation (3-3). The time lag between  $M_a$  and  $I_c$  ranges from zero to about three years. New couples create an immediate demand for rental accommodation in multiple dwelling units. After two or three years of marriage, when sufficient savings for a down payment have been accumulated, they enter the market as buyers of single family units. On the average, it is assumed that  $M_a$  would exert an influence on  $I_c$  with a time lag of one year. Finally,  $I_c$  is likely to be influenced by construction activity in the previous period.

Changes in non-farm business inventories,  $\Delta I_b$ , is a function of last year's profits  $(P_c)_{-1}$ ,

changes in final sales  $\Delta S_f$  and changes in personal consumption  $\Delta C_p$

$$\Delta I_b = \gamma_7 (P_c)_{-1} + \gamma_8 \Delta S_f + \gamma_9 \Delta C_p + u_4 \quad (3-4)$$

Changes in farm inventories,  $\Delta I_f$ , is determined by farm output,  $X_f$ , past levels of farm inventories  $(I_p)_{-1}$ , and farm prices

$$\Delta I_f = \alpha_5 + \gamma_{10} P_f + \gamma_{11} X_f + \gamma_{12} (I_f)_{-1} + u_5 \quad (3-5)$$

Inventory investment is the most unpredictable component of aggregate demand because it fluctuates erratically over the course of a year. Empirical evidence suggests that businessmen adjust their inventories completely every quarter. For this reason, inventory models for business investment are normally estimated on the basis of quarterly rather than annual data. Since the Ontario model utilizes annual observations, it is unlikely that equation (3-4) will be satisfactory from the point of view of goodness of fit and other statistical criteria. However, equations (3-4) and (3-5), although unsatisfactory as they may be, are required for the determination of gross provincial product.

## 3.7 The Import and Export Functions

The first step in developing the foreign trade sector of the model is to determine a set of explanatory variables to be used in the import and export demand equations. Most statistical studies on imports have been based on the foreign-trade multiplier theory, which postulates that aggregate imports are a function of the level of income in a given country. Short-run fluctuations in the volume of imports are mainly attributed to fluctuations in real income, particularly in industrial countries where a rise in income is usually accompanied by a rise in imports of raw materials and food.

The extent to which a country (region) is dependent upon international trade can be measured by its average propensity to import, defined as the ratio of its national (regional) income to the value of imports of goods and services. The marginal propensity to import is the change in imports resulting from a unit change in income. The concept of the propensity to import is a generalization of Keynes' concept of the propensity to consume. Its application to international trade has certain limitations because imports will not always be related to income in the same way that consumption is related to income.



A simplified econometric model of foreign trade results from the assumption that supply and demand in the domestic market are equated by imports, i.e., imports are regarded as excess domestic demand. If domestic production of the imported commodities is negligible the import function will be identical with the consumption function for such commodities, and the propensity to import will coincide with the propensity to consume. The situation is different, however, if the imported commodity is also produced domestically, or if a close substitute for the imported good is produced at home. In this case, imports of the commodity in question will compete directly with the one produced domestically, so that imports will be affected by domestic production. But in the traditional theory of production the supply of an individual commodity is directly related to the price of that commodity and not to income. Thus, unlike consumption, imports will not be related to income alone, and the concept of import propensity will be meaningless.

From the marginal propensity to import, i.e., the coefficient of the income variable in the regression of imports on income, we can derive the income elasticity of import demand. As regards the magnitude of this elasticity, when imports are considered as marginal, Harberger<sup>6</sup> has argued that its value will be low in periods of prosperity and high in periods of depression. His argument, however, has been subjected to various criticisms, which lie beyond the scope of this study. In general, we would hesitate to reach any *a priori* conclusions about the magnitude of the income elasticity of import demand.

Besides the level of income, the demand for imports will also be affected by prices, particularly when imports are competitive with domestic production. The price variable usually employed in econometric work is a ratio of two price indexes (i.e., index of import prices/wholesale price index). Knowledge of the possible effect of changes in relative prices on the volume of imports is of great significance for policy purposes, since most short-run policy instruments, such as, tariffs, devaluation etc., operate through prices and, hence, the effectiveness of such instruments depends heavily on the price elasticity of import demand.

In view of the fact that price indexes for Ontario are non-existent, it was not possible to introduce a price variable into the import demand function. Instead, lagged personal consumption was chosen as a second explana-

tory variable in addition to the current level of GPP. Thus,

$$M_w = \beta_3 \text{GPP} + \gamma_{14} (G_p)_{-1} + u_7 \quad (3-7)$$

Export demand is determined by similar considerations. What constitutes imports of Ontario from country X is also exports of country X to Ontario and vice versa. Hence, exports abroad,  $E_w$ , are influenced by the level of income of major industrial countries trading with Ontario, i.e., the United States, the United Kingdom, the Common Market countries, Japan, etc., and relative prices (export price index/domestic price index).

$$E_w = \alpha_6 + \gamma_{13} Y_{us} + u_8 \quad (3-6)$$

As in the case of imports it was not possible to incorporate a price variable into the export equation. Data on the income of foreign countries are available from United Nations publications, but each country's income is recorded in its domestic currency. This presents the difficult problem of converting the various income series into a common denominator. To avoid this problem we chose one income variable,  $Y_{us}$ , which denotes the level of GNP in the United States in current U.S. dollars, on the grounds that the bulk of Ontario exports goes to the United States.

### 3.8 Determination of Gross Provincial Product

Gross provincial product is determined from the identity

$$\text{GPP} = C_p + I_m + I_c + \Delta I_b + \Delta I_f + E_w - M_w + G_p + G_m + G_h \quad (3-28)$$

The variables on the right-hand side are endogenously determined by equations (3-1) to (3-7) with the exception of  $G_p$ ,  $G_m$ , and  $G_h$  representing respectively expenditures of provincial government, municipal governments and hospitals, which are exogenous to the model.

### 3.9 Personal Income Equations

The income side of the provincial economic accounts contains four components of personal income which are explained by the following stochastic equations:

$$Y_w = \alpha_8 + \beta_4 \text{GPP} + \gamma_{15} L_p + u_8 \quad (3-8)$$

$$Y_b = \alpha_9 + \gamma_{16} (\text{GPP} - \Delta I_f) + u_9 \quad (3-9)$$

$$Y_f = \gamma_{17} \Delta X_f + \gamma_{18} P_f + u_{10} \quad (3-10)$$

$$Y_1 = \alpha_{11} + \gamma_{19} [S_p + (S_p)_{-1}] + u_{11} \quad (3-11)$$

Wages, salaries and supplementary labour income,  $Y_w$ , of the civilian labour force is affected by the level of GPP in the current

period, and the proportion of persons employed,  $L_p$ . Military pay and allowances are not included in  $Y_w$ . Net income of non-farm unincorporated business,  $Y_b$ , is specified as a function of GPP excluding changes in farm inventories, whereas net income of farm operators from farm production,  $Y_f$ , is related to changes,  $\Delta X_f$  and the price  $P_f$  of farm output. Interest, dividends and miscellaneous investment income of persons,  $Y_1$ , is explained in terms of present and past levels of personal saving.

Total personal income,  $Y_p$ , is the sum of  $Y_w$ ,  $Y_b$ ,  $Y_f$ ,  $Y_1$ , military pay and allowances  $A$ , and transfer payments to persons,  $Z_p$ , from domestic and other sources.

$$Y_p = Y_w + Y_b + Y_f + Y_1 + Z_p + A \quad (3-29)$$

From personal income we subtract provincial personal taxes,  $T_p$ , social insurance contributions paid to the Ontario government,  $C_s$ , plus all other transfers by persons to government,  $Z_g$ , to arrive at disposable personal income

$$Y_d = Y_p - (T_p + C_s + Z_g) \quad (3-30)$$

Finally, personal saving,  $S_p$ , is obtained as residual from the identity

$$S_p = Y_d - (C_p + Z_c) \quad (3-31)$$

where  $Z_c$  represents transfers by persons to corporations and non-residents abroad.

### 3.10 Corporate Income Equations

To explain corporate income it is necessary to account for price movements since rising prices generate inventory profits. The price variable, however, can be eliminated if we explain corporate profits after inventory valuation adjustment. At the national level various statistical studies have indicated that profits react strongly to changes in national income. Thus at the provincial level we postulate that corporate profits before tax and after inventory valuation adjustment,  $P_c$ , is a function of GPP and annual changes in business inventories,  $\Delta I_b$ .

$$P_c = \beta_5 \text{GPP} + \beta_6 \Delta I_b + u_{12} \quad (3-12)$$

Corporate dividend payments,  $D_v$ , is related to past dividends and net profits.

$$D_v = \gamma_{20} (D_v)_{-1} + \gamma_{21} [P_c - (T_c + Z_x)] + u_{13} \quad (3-13)$$

where  $T_c$  and  $Z_x$  denote respectively provincial and federal corporate taxes.

<sup>6</sup>A. C. Harberger, "A Structural Approach to the Problem of Import Demand", American Economic Review, XLIII (May, 1953), p. 157.



Retained profits of corporations is derived as a residual deducting dividends and taxes from gross profits.

$$S_c = P_c - (T_c + D_v + Z_x) \quad (3-32)$$

### 1 The Personal Income Tax Sub-Model

The tax equations of an econometric model can be specified in two different ways. The simplest approach is to ignore the complexities of the tax structure and to regress tax receipts, as recorded in the economic accounts, on a set of explanatory variables which serve as proxies for the relevant tax base. Although tax receipts equations may perform well in short-term forecasting when tax rates remain unchanged, they are quite useless if we wish to analyze the implications of alternative tax policies. However, because of its simplicity, this approach has been used in a number of empirical studies as, for example, in the models of Ohio and Nova Scotia reviewed in the previous Chapter<sup>7</sup>.

The alternative approach is to take account of the complexities of the tax structure to specify the tax equations in a way that permits the introduction of tax rates. The methodology of this approach involves the reconciliation of two different sets of tax rates; the tax data available in the economic accounts with those available in *Taxation Statistics*.

In developing the tax equations of the Ontario model we chose the second alternative because despite its complexities it has the advantage of providing answers to important policy questions, by allowing the evaluation of the fiscal effects of changes in tax rates. The specification of tax equations is based on the methodology outlined in a recent study by the Bank of Canada Research<sup>8</sup>, with certain modifications and adaptations required to preserve consistency in the full model.

Provincial income taxes are collected by the federal government on behalf of the province under the Federal-Provincial Tax-sharing Agreements of 1962. The Ontario personal tax is calculated as a percentage of the "basic tax" which represents the total personal income tax on the taxable income of persons resident on the 31st December in the province, plus any tax adjustments and less dividend tax credit. The rates were 16 per cent for the 1962 taxation year, 17 per cent for 1963, 18 per cent for 1964, 19 per cent for 1965, 24 per cent for 1966 and 28 per cent for 1967 and 1968.

Ohio model (see page 8) contains one equation (2-39) which explains retail sales receipts in terms of retail sales. The Scotia model (see page 11) has three tax

We begin the description of the income tax sub-model with the classification of Ontario taxpayers into four income classes, each class containing a number of income groups as follows:

Table 3-1 — Classification of Ontario Taxpayers According to Assessed Personal Income

Income Groups	Income Classes			
	Class 1	Class 2	Class 3	Class 4
Group 1	0-1,999	3,000-3,999	5,000-5,999	10,000-14,999
Group 2	2,000-2,999	4,000-4,999	6,000-6,999	15,000-19,999
Group 3			7,000-7,999	20,000-24,999
Group 4			8,000-8,999	25,000-over
Group 5			9,000-9,999	
Class Range	0-2,999	3,000-4,999	5,000-9,999	10,000-over

By utilizing the information available in *Taxation Statistics* we compute first a weighted average basic tax rate  $(W_r)_i$  for each income class using the identity

$$(W_r)_i = \sum_{j=1}^n [(T_b)_{ji}/(\bar{Y}_t)_{ji}] [(Y_a)_{ji}/(Y_a)_i] \quad (3-35)$$

where  $i = 1, \dots, 4$  corresponds to the  $i$ th income class and  $j = 1, \dots, n$  ( $n \leq 5$ ) corresponds to the  $j$ th income group, i.e.,  $(Y_a)_{ji}$  denotes personal income assessed by taxpayers in the  $j$ th income group of the  $i$ th income class.

The next step is to compute personal basic tax accruals,  $B_a$ , from the relation

$$B_a = \sum_{i=1}^4 (W_r)_i [(Y_a)_i - (N_r)_i (\bar{T}_x)_i] - R_v (D_o) \quad (3-34)$$

Multiplying  $B_a$  by the Ontario personal income tax rate,  $R_p$ , we obtain personal income tax accruals,  $T_p^*$  from the identity

$$T_p^* = R_p (B_a) \quad (3-33)$$

In the final step we reconcile personal income tax accruals, derived from taxation statistics, with personal income tax collections,  $T_p$ , obtained from the provincial economic accounts, using the stochastic equation

$$T_p = \beta_8 T_p^* + u_{15} \quad \beta_8 > 1 \quad (3-15)$$

Ideally, the two tax series representing collections,  $T_p$ , and accruals,  $T_p^*$ , should be identical, in which case the estimated value of the coefficient  $\beta_8$  should be equal to unity.

In actual fact, however, tax accruals based on taxation statistics are likely to be underestimated in relation to tax collections based on provincial accounts for two reasons. First, taxation data are derived from a sample

covering approximately six per cent of total tax returns. The sample excludes armed forces and the data fail to take into account tax adjustments. Secondly, a portion of income is not reported on tax returns. Hence, in general  $T_p > T_p^*$  and we must impose the *a priori* restriction  $\beta_8 > 1$  on the coefficient of  $T_p^*$ .

The statistical relationship (3-15) and the identities (3-33), (3-34) and (3-35) are sufficient for explaining the income tax structure prevailing in the past. The usefulness of the personal income tax sub-model can, however, be enhanced by specifying some additional equations which facilitate forecasting and policy analysis. In particular, we require that at least three variables be determined stochastically — the number of taxable returns, assessed personal income and personal tax exemptions and deductions — in view of the fact that there is normally a publication lag of two years in *Taxation Statistics*.

The total number of taxable returns of individuals,  $N_r$ , is determined by a time trend and the number of persons employed in the previous period. This formulation makes it easy to forecast  $N_r$  in the next period.<sup>9</sup>

$$N_r = \gamma_{24} (L_e)_{-1} + \gamma_{25} t + u_{18} \quad (3-18)$$

Knowing  $N_r$  we can estimate  $(N_r)_i$ , the number of taxable returns in the second, third and fourth income class from the identities

$$(N_r)_i = (P_r)_i N_r \quad i = 2, \dots, 4 \quad (3-41)$$

equations, (2-70), (2-74) and (2-75) explaining respectively, total personal income taxes, corporate profit taxes and total indirect taxes.

<sup>8</sup>See John F. Helliwell et al., Government Sector Equations for Macroeconomic Models, Bank of Canada, Staff Research Studies, No. 4, 1969.



Finally, the number of returns in the first income class is obtained as a residual

$$(N_r)_1 = N_r - \sum_{i=2}^4 (N_r)_i \quad (3-40)$$

Similarly, total income assessed in year  $t$  is a function of personal income earned in year  $t-1$ .<sup>10</sup>

$$Y_a = \alpha_{16} + \gamma_{22} (Y_p)_{-1} + u_{16} \quad (3-16)$$

Personal income assessed in the  $i$ th income class is obtained using the identities

$$(Y_a)_i = (P_y)_i Y_a \quad i = 2, \dots, 4 \quad (3-37)$$

except the income assessed in the first income class which is derived as a residual

$$(Y_a)_1 = Y_a - \sum_{i=2}^4 (Y_a)_i \quad (3-36)$$

Total tax exemptions and deductions,  $T_x$ , is related to tax returns and a time variable

$$T_x = \beta_9 N_r + \gamma_{23} t + u_{17} \quad (3-17)$$

Tax exemptions and deductions in the  $i$ th income class is derived from

$$(T_x)_i = (P_x)_i T_x \quad i = 2, \dots, 4 \quad (3-39)$$

and

$$(T_x)_1 = T_x - \sum_{i=2}^4 (T_x)_i \quad (3-38)$$

The proportions  $(P_r)_i$ ,  $(P_y)_i$  and  $(P_x)_i$  are computed from (3-41), (3-37) and (3-39) respectively, utilizing taxations statistics. The calculated values suggest that these proportions have exhibited a systematic movement over the period 1962-68 and, hence, they can be easily forecast beyond the observation period by extrapolation or other methods.

### 3.12 Corporate Profit Taxes

Since 1957, when the Federal-Provincial Tax Sharing Arrangements Act came into effect, Ontario levies and collects its own tax on corporation profits. The provincial corporate income tax rate was 11 per cent during the period 1957-1966, of which 9 per cent constituted an abatement of federal tax and 2 per cent a surcharge over and above the abatement. From 1967 the federal abatement was increased to 10 per cent bringing the provincial rate up to 12 per cent. Prior to 1957 Ontario had rented for some years its corporation tax field to the federal government. Due to these institutional changes in the administration of the tax, the corporate tax equations of the model attempt to explain the corporate tax structure in Ontario after the year 1957.

Utilizing the information available in *Taxation Statistics* we first construct a series for corporation taxable income,  $Y_c$ , on which we apply the corporate tax rate,  $R_c$ , to derive the computed values of corporate profit taxes

$$T_c^* = R_c (Y_c) \quad (3-42)$$

The series  $T_c^*$  is then reconciled with corporate profit tax accruals,  $T_c$ , as they appear in the provincial economic accounts, according to the stochastic relationship

$$T_c = \beta_{10} T_c^* + u_{19} \quad (3-19)$$

For policy analysis and forecasting purposes  $Y_c$  must be obtained endogenously and, hence, we need one more stochastic equation

$$Y_c = \alpha_{20} + \gamma_{26} (P_c)_{-1} + u_{20} \quad (3-20)$$

The operation of the corporate tax sub-model can be described as follows: Given  $P_c$  in the current period,  $t$ , we derive from (3-20) a forecast value for  $Y_c$  in period  $t+1$ , which substituted into (3-42) yields  $T_c^*$  in year  $t+1$ . Finally, using (3-19) we obtain a forecast for  $T_c$  one period ahead. Similarly, knowing  $P_c$  in year  $t+1$  we can predict  $T_c$  in year  $t+2$  etc.<sup>11</sup> It is also possible to study the effects of changes in the tax rate,  $R_c$ , on government revenue and other variables in the model.

### 3.13 Gasoline Tax

The basis of the gasoline tax is the net taxable sales of gasoline fuel,  $F_g$ , and the net taxable sales of diesel fuel,  $F_d$ , measured in gallons. The tax rates are expressed in cents per gallon, for example, the rate for gasoline,  $R_g$ , was 18 cents per gallon in 1968, and the rate for diesel,  $R_d$ , was 24 cents per gallon in the same year. Data on fuel sales and tax rates are readily available from DBS publications. Using this information we can obtain computed values of gasoline taxes as follows:

$$T_g^* = R_g (F_g) + R_d (F_d) \quad (3-45)$$

Gasoline tax collections,  $T_g$ , as they appear in the provincial accounts is then related stochastically to  $T_g^*$

$$T_g = \beta_{11} T_g^* + u_{21} \quad (3-21)$$

The variables  $F_g$  and  $F_d$  display a systematic trend over the years and can be easily forecast using a time trend.

### 3.14 Retail Sales Tax

The retail sales tax was first imposed in Ontario in 1961. The rate of sales tax was 3 per cent from 1961 to 1965 and 5 per cent there-

after. This rate applies on all retail sales with the exception of food products, drugs, school books and some other items. As in the previous case of the gasoline tax, we specify two equations for the retail sales tax: one stochastic and one identity.

$$T_s = \beta_{12} T_s^* + u_{22} \quad \beta_{12} < 1 \quad (3-22)$$

$$T_s^* = R_s (S_r) \quad (3-23)$$

The identity helps to determine a series of computed values of sales taxes,  $T_s^*$ , applying the tax rate,  $R_s$ , on total retail sales,  $S_r$ . Since no adjustment was made to exclude from  $S_r$  retail sales not subject to tax, computed tax accruals,  $T_s^*$ , appear to be greater than the actual tax collections,  $T_s$ , recorded in the provincial accounts and, therefore, the estimated coefficient  $\beta_{12}$  is expected to be less than one.

### 3.15 Hospital Insurance Premiums

The basis for explaining hospital insurance premiums is the civilian labour force, since all persons employed are socially insured through payroll deductions. The monthly premium paid in Ontario by married contributors,  $R_{hm}$ , is twice as much as the monthly rate paid by single persons including those divorced and widowed. The single monthly rate was \$2.10 between 1961 and 1963, \$3.25 from 1964 to June 1968, and \$5.50 from July 1968. From 1961 census data we compute the ratios  $L_m/L_t$  and  $L_s/L_t$  representing respectively the proportion of married males and single persons in the labour force, which we assume to apply in other years. Using this information we can calculate a weighted average premium rate

$$R_h = 12 [R_{hm} (L_m/L_t) + R_{hs} (L_s/L_t)] \quad (3-24)$$

which we apply on the labour force to obtain a computed series for hospital insurance premiums

$$H_1^* = R_h (L_t) \quad (3-25)$$

This series is related stochastically to the hospital premiums series  $H_1$  as it appears in the provincial accounts.

$$H_1 = \beta_{13} H_1^* + u_{23} \quad (3-26)$$

### 3.16 Motor Vehicle Licences and Permits

The licence fee for motor vehicles in Ontario is uniform regardless of whether a vehicle is used for personal or business purposes. Accordingly, the dependent variable  $V_m$  equals total fees for motor vehicle licences and

<sup>10</sup>Strictly speaking,  $N_r$  in the year  $t$  will depend on  $L_e$  in the same year. However, the inclusion of current  $L_e$  in equation (3-18) imposes the difficult problem of forecasting employment, which for lack of data, we have been unable to explain endogenously in the model.

<sup>11</sup>A more appropriate specification of equation (3-16) is to use current  $Y_p$  as an explanatory variable. In such a case, forecast values of  $Y_a$  can only be obtained by forecasting  $Y_p$ , which entails the simultaneous solution of eleven equations comprising the GPP and personal

income blocks of the model.

<sup>12</sup>Equation (3-20) can also be specified in terms of current profits, in which case we must forecast  $P_c$  prior to forecasting  $Y_c$ . This requires the simultaneous solution of eight equations explaining profits and the GPP components.



Table 3-2 – Matrix of Endogenous Variables

Equation No.	$I_m$	$\Delta I_b$	$\Delta I_f$	$E_w$	$Y_b$	$Y_f$	$Y_1$	$D_v$	$T_p$	$T_c$	$T_g$	$T_s$	$H_1$	$V_1$	$P_1$	$Y_g$	$I_c$	$M_w$	$C_p$	GPP	$Y_w$	$P_c$	$C_s$	$T_o$	$Y_p$	$Y_d$	$S_p$	$S_c$	PGR
0																													
1	X																												
2		X																											
3			X																										
4				X																									
5					X																								
6						X																							
7							X																						
8								X																					
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its paid by both persons and business. basis of the fee is the number of cylinders and the year of the vehicle. Effective January 1, 1968, the rates for models after 1967 are as follows: \$20.00 for 4 cylinders or less, \$27.50 for 6 cylinders and \$35.00 for 8 cylinders or more. Since data on car registrations by cylinder are not available it is not possible to compute a weighted average fee per registered motor vehicle. Thus, the fee is simply correlated with  $V_r$  denoting the number of registered motor vehicles (types) in Ontario.

$$V_m = \alpha_{24} + \gamma_{27} V_r + u_{24} \quad (3-24)$$

#### Profits of Liquor Commissions

Revenue from profits of liquor commissions, is related to per capita personal income,

$$P_b = \alpha_{25} + \gamma_{28} \bar{Y}_p + u_{25} \quad (3-25)$$

### 3.18 Other Components of Government Revenue

The remaining components of government revenue are various indirect taxes, investment income and transfer payments. Other indirect taxes not explained individually in the model include the following:

- Amusement taxes
- Corporation taxes (not on profits)
- Other licences, fees and permits
- Miscellaneous taxes on natural resources
- Real property taxes
- Miscellaneous

The sum of all these items, denoted by  $T_o$ , is regressed on personal consumption expenditure

$$T_o = \alpha_{26} + \beta_{14} C_p + u_{26} \quad (3-26)$$

Government investment income (interest and royalties) is linearly related to total government expenditure

$$Y_g = \alpha_{27} + \gamma_{29} G_p + u_{27} \quad (3-27)$$

Transfer payments from federal and local governments are exogenous to the model. Finally, employer and employee contributions to social insurance,  $C_s$ , is a function of wages and salaries,  $Y_w$ , in equation (3-14).

Total provincial government revenue is the sum of all revenue components as follows:

$$PGR = C_s + T_p + T_c + T_g + T_s + T_o + V_m + P_b + H_1 + Y_g + Z_w \quad (3-47)$$

### 3.19 Interdependency and Recursiveness in the Ontario Model

Having specified the Ontario econometric model in equations (3-1) to (3-47) the

genous variable, i.e., the variable  $C_p$  appears in equations (3-1), (3-26), (3-28) and (3-31).

It is evident from Table 3-2 that the Ontario model is interdependent, since there exist non-zero coefficients of endogenous variables above the main diagonal of the matrix, that is, the matrix is not triangular. The non-recursiveness of the model results from the presence of two equations, namely the import function (3-7) which establishes a direct and mutual interdependency between  $M_w$  and GPP, and the consumption function (3-1) which specifies an indirect interdependency between  $C_d$  and  $S_d$  via  $Y_d$ .

$$M_w = \gamma_{31} (GPP)_{-1} + u_7 \quad (3-47)$$

If we replace equations (3-1) and (3-47) in (3-46) and (3-48) and (3-49) respectively the model becomes fully recursive.



## 0 Identification of the Interdependent Model

Before we attempt to estimate the model it is necessary to investigate whether unique values can be obtained for the structural parameters, that is, whether the stochastic equations of the model are identifiable. The problem of identification is, therefore, logically prior to the problem of estimation.

The nature of the identification problem in econometric models can be discussed in the context of a simple example. Consider a naive model in which the supply and demand for commodity X in a competitive market are determined by price

$$D_t = \alpha_0 + \alpha_1 P_t + u_t$$

$$S_t = \beta_0 + \beta_1 P_t + v_t$$

$$D_t = S_t$$

where  $D_t$  and  $S_t$  denote respectively the quantity of X demanded and supplied at time  $t$ ,  $P_t$  is the market clearing price and  $u_t$  and  $v_t$  are random disturbances. Suppose that two independent investigators are analysing the market for commodity X using data on quantity and price. Investigator A fits the demand equation and asserts that he has estimated the demand curve, whereas investigator B fits the supply equation and postulates that he has estimated the supply curve. Since, however, both investigators fitted a regression equation of the same statistical form, utilizing the same data, the results must necessarily be the same. The question arises how can we tell whether it is the supply or the demand curve. This is the problem of identification.<sup>12</sup>

In the above model neither the demand nor the supply equation is identified because both equations have the same statistical form, that is, they contain exactly the same variables. We can state, therefore, that a model is identified if each of the structural equations has a unique statistical form. This condition is satisfied if linear combinations of the other equations in the model cannot produce an equation, different from the one in question, containing exactly the same variables. It follows from this definition that recursive models are, in general, identified because they possess the property that the matrix of coefficients of the endogenous variables is triangular, which ensures that each of the equations has a unique statistical form. In interdependent models, on the other hand, where no restriction is imposed on the form of the coefficient matrix, it is necessary to investigate the identifiability of each and every equation.

There are two criteria for determining the identifiability of the structural equations in linear models.

- a) The order condition of identifiability
- b) The rank condition of identifiability

The order condition states that a structural equation within a model is identified if the number of predetermined variables excluded from that equation is at least equal to the number of endogenous variables included less one. Suppose, for example, that we wish to investigate the identifiability of the  $i$ th equation in a model consisting of  $G$  equations in  $G$  endogenous and  $K$  predetermined variables. Let  $G\Delta$  and  $K_x$  denote the number of endogenous and predetermined variables respectively included in the  $i$ th equation, and  $G\Delta\Delta$  and  $K_{xx}$  the number of endogenous and predetermined variables excluded from the  $i$ th equation. Applying the order condition we have three possibilities.

If  $K_{xx} < G\Delta - 1$

the  $i$ th equation is said to be under-identified.

If  $K_{xx} = G\Delta - 1$

the  $i$ th equation is exactly identified.

Finally, if  $K_{xx} > G\Delta - 1$

the  $i$ th equation is over-identified.

Various estimation methods can be applied to exactly and over-identified equations. On the other hand, under-identified equations cannot be estimated statistically. If such equations exist in a model they must be properly re-specified in a way that makes them identifiable.

The order criterion is merely a counting rule and its application is simple and straightforward. The disadvantage of the order condition is that it is necessary but not sufficient. The rank condition is both necessary and sufficient but its application is rather complicated because it involves the computation of the rank of a sub-matrix of coefficients properly arranged as follows: First, we arrange the coefficients of the endogenous variables in a matrix form, as we did in Table 3-2, which we call the B matrix of coefficients. In the same way we arrange the coefficients of the predetermined variables. The resulting matrix is called the  $\Gamma$  matrix of coefficients. The next step is to define a new matrix A which contains both the B and the  $\Gamma$  matrices.

$$A = [B\Gamma]$$

From the matrix A we select the sub-matrix  $A\Delta\Delta_{xx}$  having  $G\Delta$  rows and  $K_{xx}$  columns.

The rank condition states that the  $i$ th structural equation is identified if the rank,  $\rho$ , of  $A\Delta\Delta_{xx}$  is equal to the number of equations less one, that is

$$\rho(A\Delta\Delta_{xx}) = G - 1.$$

In practice the computation of the rank of sub-matrices from A is quite involved and can be only performed by a computer. And since the computer input must consist of numbers rather than letters, such as,  $b_{ij}$  and  $\gamma_{ij}$  which denote coefficients, it follows that the rank condition can be applied only after values have been obtained for the structural or the reduced-form parameters<sup>13</sup>. The order criterion although not sufficient can be used prior to estimation for investigating the identifiability of the structural equations in a model.

The order condition was applied to the Ontario interdependent model. The result was that all equations in the model were found to be over-identified.

## IV ESTIMATION OF THE ONTARIO ECONOMETRIC MODEL

### 4.1 Statistical Data Sources

The statistical series utilized to estimate the parameters of the Ontario econometric model were taken, for the most part, from the Ontario economic accounts compiled by the Economic Analysis Branch. A limited number of variables representing components of personal income and taxation data were available in publications of the Dominion Bureau of Statistics and the Department of National Revenue.

The Economic Analysis Branch has initiated the development of two alternative sets of income and expenditure estimates for the province of Ontario, one based on the "national" concept<sup>1</sup> and the other on the "domestic" concept. A detailed description and comparative analysis of these two sets of estimates is scheduled for publication in the *Ontario Economic Review*. For the purpose of estimating the parameters of the model the time series based on the "domestic" concept were used.

Most of the equations were estimated on the basis of 21 annual observations, however, in some cases only a shorter time period could be used. For example, equation (3-22), which explains sales taxes, was fitted to the period 1961-68 since the sales tax was first imposed in Ontario in 1961.

<sup>12</sup>Daniel B. Suits, *The Theory and Estimation of Econometric Models*. Centre of Economic Research, Training Seminar Series, Athens 1963, p. 117.

<sup>13</sup>The rank condition can be stated either in

terms of the structural coefficients, as above, or in terms of the reduced-form coefficients of the model. See J. Johnston, *Econometric Methods*, McGraw-Hill Book Company, Inc. New York 1963, p. 252.

<sup>1</sup>See M. V. Chari and R. H. Frank, "The Development of Ontario Economic Accounts", *Ontario Economic Review*, Vol. 8, No. 6, Nov/Dec 1970.



All monetary variables are expressed in current dollars, since price deflators relating to the province as a whole are not available.

4.2 Methods of Parameter Estimation

The structural parameters of the model were estimated by using two statistical methods; Ordinary Least-Squares (OLS) and Two-Stage Least-Squares (TSLS). As shown in Appendix B, the OLS method when applied to a system of mutually interdependent relationships yields biased and inconsistent estimates of the parameters. The TSLS method, on the other hand, gives consistent estimators, as discussed in Appendix C. Our estimation procedure involved the combined use of both methods.

During the experimentation stage, the OLS method was used to test alternative hypotheses about economic behaviour. Once the final choice of the best equations was made, on the basis of statistical and other criteria, the TSLS method was employed to re-estimate the parameters in equations which included current endogenous variables on the right-hand side. Although this constitutes a standard procedure in applied econometrics, some authors<sup>2</sup> have suggested that in testing

alternative specifications in simultaneous-equation systems it is more appropriate to use the simultaneous-equation TSLS method and not the single-equation OLS method because each relationship should not be judged individually but in terms of the complete model. It must be remembered, however, that the asymptotic property of consistency gained with TSLS presupposes very large samples and provides cold comfort to econometricians working typically with twenty or so observations.

The classical TSLS method as developed in Appendix C requires in the first stage that each of the endogenous variables be regressed on the complete set of all predetermined variables. In practice, however, this is not always feasible because the number of predetermined variables may exceed the number of observations, in which case it is necessary to select a suitable number of variables to be included in the regressions.

The Ontario model contains about 34 predetermined variables whereas the sample size consists of only 21 observations. Thus, about half of the variables had to be ignored during the first stage of the TSLS procedure. The

selection of variables was based on the contribution of alternative subsets of predetermined variables on the explanation of dependent variables, as measured by the corrected coefficient of multiple determination<sup>3</sup>. The predetermined variables used in the first stage regressions were the following:  $(C_p)_{-1}$ ,  $(I_m)_{-1}$ ,  $(P_c)_{-1}$ ,  $(M_a)_{-1}$ ,  $(I_c)_{-1}$ ,  $\Delta X_t$ ,  $(I_t)_{-1}$ ,  $Y_{us}$ ,  $L_p$ ,  $G_p$ ,  $S_p + (S_p)_{-1}$ ,  $P_t$ ,  $\Delta I_t$  and  $(GPP - \Delta I_t)$

4.3 The Estimated Equations

The estimated parameters of the Ontario model are presented in this Section. Equations (4-1) to (4-27) are those estimated by OLS and have been selected among various specifications which will be discussed in later Sections of this study. Equations (4-28) to (4-34) have been estimated by the TSLS method. For each equation the numbers in parentheses beneath the coefficients denote standard errors,  $\bar{R}^2$  is the coefficient of multiple determination adjusted for degrees of freedom, DW represents the Durbin-Watson statistic and VN is the von-Neumann ratio. The period of fit is also given for each individual relationship.

EQUATIONS ESTIMATED BY OLS

$$C_p = 0.60864 Y_d + 0.36328 (C_p)_{-1}$$

(0.08397)

(0.09815)

1948-68

$\bar{R}^2 = 0.9999$

DW = 0.4082

VN = 0.4286

$$I_m = 0.37928 (I_m)_{-1} + 0.28847 (P_c)_{-1} + 0.17582 \Delta GPP$$

(0.10094)

(0.06452)

(0.03287)

1948-68

$\bar{R}^2 = 0.9967$

DW = 1.8998

VN = 1.9948

$$I_c = 0.42143 I_m + 0.00194 (M_a)_{-1} + 0.68579 (I_c)_{-1}$$

(0.09768)

(0.00151)

(0.09104)

1948-68

$\bar{R}^2 = 0.9958$

DW = 1.9273

VN = 2.0237

$$\Delta I_b = 0.05399 (P_c)_{-1} + 0.17769 \Delta S_t - 0.08214 \Delta C_p$$

(0.05743)

(0.05787)

(0.16971)

1948-68

$\bar{R}^2 = 0.7426$

DW = 2.5645

VN = 2.6930

$$\Delta I_t = 984.844 - 9.44460 P_t + 0.56931 X_t - 0.65386 (I_t)_{-1}$$

(446.755)

(5.72596)

(0.32168)

(0.21038)

1948-68

$\bar{R}^2 = 0.2564$

DW = 1.9100

VN = 2.0055

$$E_w = -197.765 + 15.4291 Y_{us}$$

(74.1155)

(1.69192)

1948-68

$\bar{R}^2 = 0.8042$

DW = 2.1883

VN = 2.2977

$$M_w = 0.20248 GPP + 0.06717 (C_p)_{-1}$$

(0.00683)

(0.01193)

1948-68

$\bar{R}^2 = 0.9999$

DW = 1.7437

VN = 1.8309

$$Y_w = 5008.00 + 0.57687 GPP - 56.2500 L_p$$

(1848.73)

(0.00350)

(18.9715)

1948-68

$\bar{R}^2 = 0.9993$

DW = 1.3061

VN = 1.3715

$$Y_b = 114.901 + 0.04263 (GPP - \Delta I_t)$$

(22.3920)

(0.00459)

1948-68

$\bar{R}^2 = 0.8100$

DW = 2.0130

VN = 2.1136

$$Y_t = 0.28207 \Delta X_t + 2.91652 P_t$$

(0.13133)

(0.08833)

1948-68

$\bar{R}^2 = 0.9881$

DW = 0.4306

VN = 0.4521

$$Y_1 = 37.2239 + 0.60846 [S_p + (S_p)_{-1}]$$

(16.7488)

(0.03218)

1949-68

$\bar{R}^2 = 0.9494$

DW = 1.2861

VN = 1.3538

$$P_c = 0.11420 GPP + 0.41328 \Delta I_b$$

(0.00267)

(0.17774)

1948-68

$\bar{R}^2 = 0.9962$

DW = 1.4761

VN = 1.5499

$$D_v = 0.54416 (D_v)_{-1} + 0.21138 [P_c - (T_c + Z_x)]$$

(0.11043)

(0.04428)

1957-68

$\bar{R}^2 = 0.9991$

DW = 1.9837

VN = 2.1641

$$C_s = 0.00814 Y_w$$

(0.00013)

1948-68

$\bar{R}^2 = 0.9948$

DW = 1.6262

VN = 1.7075

<sup>2</sup>See R. G. Ball, "The Significance of Simultaneous Methods of Parameter Estimation in Econometric Models", Applied Statistics, Vol. 12, 1963, pp. 14-25.

<sup>3</sup>The selection procedure was systematic based on the methodology developed in Y. Haitovsky "A Note on the Maximization of  $\bar{R}^2$ ", The American Statistician, February 1969, pp.

20-21, and M. Karasek "An Approximate Maximization Scheme: A Tool for Experimenting with Economy-Wide Econometric Models", Working Paper, Econometric Section, Economic Analysis Branch, May, 1970 (unpublished)



$= 1.12097 T_p^*$ (0.01663)	(4-15)	$P_b = -12.5046 + 0.05157 \bar{Y}_p$ (2.71913)(0.00400)	(4-25)
1962-68 $\bar{R}^2 = 0.9987$ DW = 0.7787 VN = 0.9085		1948-68 $\bar{R}^2 = 0.8919$ DW = 1.8094 VN = 1.8999	
$= -2659.75 + 0.98134 (Y_p)_{-1}$ (598.530)(0.03809)	(4-16)	$T_o = -12.2678 + 0.01159 C_p$ (5.14340)(0.00054)	(4-26)
1962-68 $\bar{R}^2 = 0.9910$ DW = 1.4707 VN = 1.7158		1947-68 $\bar{R}^2 = 0.9559$ DW = 1.4439 VN = 1.5126	
$= 1.99919 N_r + 20.1250 t$ (0.01811) (9.68912)	(4-17)	$Y_g = -11.3857 + 0.15388 G_p$ (3.03027)(0.00597)	(4-27)
1962-68 $\bar{R}^2 = 0.9999$ DW = 1.8740 VN = 2.1863		1948-68 $\bar{R}^2 = 0.9708$ DW = 1.1866 VN = 1.2459	
$= 0.81086 (L_e)_{-1} + 89.5671 t$ (0.01245) (6.93043)	(4-18)	EQUATIONS ESTIMATED BY TSLS	
1962-68 $\bar{R}^2 = 0.9998$ DW = 1.9189 VN = 2.2387		$C_p = 0.58740 Y_d + 0.38843 (C_p)_{-1}$ (0.10375) (0.12121)	(4-28)
$= 1.09452 T_c^*$ (0.01498)	(4-19)	1948-68 $\bar{R}^2 = 0.9998$ DW = 0.9946 VN = 1.0444	
1958-67 $\bar{R}^2 = 0.9983$ DW = 1.8728 VN = 2.0809		$I_c = 0.44138 I_m + 0.00201 (M_a)_{-1} + 0.66785 (I_c)_{-1}$ (0.10227) (0.00151) (0.09455)	(4-29)
$= 596.008 + 0.55953 (P_c)_{-1}$ (121.882) (0.05772)	(4-20)	1948-68 $\bar{R}^2 = 0.9958$ DW = 1.6319 VN = 1.7135	
1958-67 $\bar{R}^2 = 0.9117$ DW = 2.0574 VN = 2.2860		$M_w = 0.20360 GPP + 0.06635 (C_p)_{-1}$ (0.00864) (0.01505)	(4-30)
$= 0.99467 T_g^*$ (0.00346)	(4-21)	1948-68 $\bar{R}^2 = 0.9999$ DW = 2.1922 VN = 2.3018	
1957-68 $\bar{R}^2 = 0.9999$ DW = 2.1283 VN = 2.3218		$Y_w = 4768.00 + 0.57903 GPP - 53.9375 L_p$ (2193.07) (0.00416) (22.5046)	(4-31)
$= 0.09108 T_s^*$ (0.00511)	(4-22)	1948-68 $\bar{R}^2 = 0.9991$ DW = 1.8538 VN = 1.9465	
1961-68 $\bar{R}^2 = 0.9784$ DW = 0.8294 VN = 0.9478		$P_c = 0.11461 GPP + 0.40958 \Delta I_b$ (0.00270) (0.17875)	(4-32)
$= 0.96445 H_1^*$ (0.02635)	(4-23)	1948-68 $\bar{R}^2 = 0.9961$ DW = 1.5106 VN = 1.5861	
1959-68 $\bar{R}^2 = 0.9933$ DW = 2.5097 VN = 2.7886		$C_s = 0.00814 Y_w$ (0.00009)	(4-33)
$= -12.7805 + 0.04962 V_r$ (3.78574)(0.00528)	(4-24)	1948-68 $\bar{R}^2 = 0.9977$ DW = 0.9641 VN = 1.0123	
1948-68 $\bar{R}^2 = 0.8135$ DW = 1.6801 VN = 1.7641		$T_o = -13.8064 + 0.01172 C_p$ (5.57069)(0.00058)	(4-34)
		1948-68 $\bar{R}^2 = 0.9538$ DW = 1.5340 VN = 1.6107	

### Evaluation of Statistical Results

begin the evaluation of statistical findings in a general discussion of the estimates in the framework of the entire model. In this section we investigate the statistical significance of the estimated coefficients, the degree of fit and the assumption of serial independence of the disturbance terms for each equation. In subsequent Sections we present some additional results obtained

during the experimentation stage of testing alternative specifications.

The explanatory power of a regression relationship fitted by the method of least-squares is measured by the coefficient of multiple determination, denoted by  $R^2$  and defined as the ratio of the "explained" variation to the "total" variation of the observations on the dependent variable about their sample mean. However,  $R^2$  is biased upward because it is directly related to the number of

explanatory variables in the regression so that in general the larger the number of explanatory variables the higher the value of  $R^2$ . For this reason we use the adjusted coefficient of multiple determination, denoted by  $\bar{R}^2$  and defined as

$$\bar{R}^2 = 1 - (1 - R^2) \frac{n-1}{n-k}$$

where  $n$  denotes the sample size and  $k$  the number of variables appearing in the equation. When  $n$  is large  $R^2$  and  $\bar{R}^2$  will be ap-

proximately the same, but when  $n$  is small relative to  $k$ ,  $\bar{R}^2$  will be less than  $R^2$ . Nevertheless,  $\bar{R}^2$  is a better measure of the goodness of fit because it takes account of degrees of freedom and it is an unbiased estimator of the expected explanatory power of a least-squares regression. The coefficients  $\bar{R}^2$  in equations (4-1) to (4-34) are quite high in every case with the exception of equations (4-4) and (4-5) which explain changes in inventories. It was not possible to improve upon these two equations for reasons discussed in the previous Chapter.

The statistical significance of each individual coefficient can be tested quickly by inspection without consulting the tables of the  $t$  distribution. At the conventional 5 per cent probability level, assuming two estimated parameters, the critical value of the  $t$  statistic is 2.093 when the sample consists of 21 observations, and 1.960 when the sample is infinite. Thus disregarding sample size we can see that the critical value of  $t$  centers around 2, which suggests that a particular coefficient will be statistically significant only if its value is at least twice as large as its standard error. From the 54 coefficients in equations (4-1) to (4-27) estimated by OLS, five lack significance, one coefficient in equation (4-3), two in equation (4-4) and two in equation (4-5). The coefficients estimated by TSLS in equations (4-28) to (4-34) are significant except one in equation (4-29). All coefficients have the correct sign in both sets of estimates.

The validity of the significance tests depends on the condition that the disturbance term in each statistical equation satisfies the assumption of serial independence, which implies that successive disturbances are not correlated so that their covariance is vanishing. The violation of this assumption introduces the problem of autocorrelation which affects unfavourably the efficiency of estimators and, therefore, invalidates the standard tests of significance of the regression coefficients.

In general, the existence of autocorrelation in a relationship indicates a mis-specification in the sense that one or more explanatory variables which exert an important influence on the dependent variable have been excluded from the regression and have, therefore, been included in the disturbance term. The result is that the disturbances exhibit a systematic behaviour which contradicts the assumption of serial independence.

The most commonly used tests for autocorrelation are the von-Neumann ratio and the Durbin-Watson  $d$  statistic, which we denote by VN and DW respectively. Strictly speaking the VN test is applicable to large samples and it is questionable whether the test is reliable for small samples. The DW test, on the other hand, is suitable for the small sample case, however, it can be shown that this test is not appropriate when lagged endogenous variables are included in an equation.<sup>4</sup>

The procedure of the VN test is to obtain from tables the two critical values corresponding to positive and negative autocorrelation for a specified sample size and probability level. Then, if the computed VN ratio lies between the two critical values we accept the hypothesis of no autocorrelation, otherwise the hypothesis is rejected. To apply the DW test we find from tables the lower and upper bound of the statistic for a particular sample size and number of independent variables. If the computed DW value is greater than the upper bound we accept the hypothesis of no autocorrelation. Conversely, if the computed DW is less than the lower bound we reject the hypothesis of no autocorrelation and accept the hypothesis of positive autocorrelation. Finally, if the computed DW lies between the lower and upper bounds the test is inconclusive.

For a sample of 21 observations the critical region of the VN test is 1.3805 — 2.8195 at the 5 percent and 1.1131 — 3.0869 at the 1 per cent significance points. For the same sample size the lower and upper bounds of the DW test are 1.13 and 1.54 respectively, for two independent variables and 1.03 and 1.67 for three independent variables. Thus, we can detect the existence of autocorrelation in equations (4-1) and (4-10) in the OLS estimates and (4-28) and (4-33) in the TSLS estimates. The DW test is inconclusive in equations (4-2), (4-5), (4-8) and (4-11) and indicates positive autocorrelation in (4-27). However, these equations pass the VN test.

If one of the tests for autocorrelation indicates that in a particular equation we have autocorrelated disturbances various methods are available to deal with this problem. A method most frequently used in practice consists of a number of steps or iterations as follows: Consider the two variable case where,

$$Y_t = \alpha + \beta X_t + u_t \quad (4-a)$$

Assuming that the error term follows a first order autoregressive scheme we can write

$$u_t = \rho u_{t-1} + e_t \quad (4-b)$$

where  $\rho$  is the autocorrelation coefficient and  $e$  denotes a random error term having O properties. Lagging (4-a) by one period and subtracting we have

$$Y_t - \rho Y_{t-1} = \alpha + \beta X_{t-1} + u_{t-1} \quad (4-c)$$

Multiplying (4-c) by  $\rho$  and subtracting from (4-a) we obtain

$$Y_t - \rho Y_{t-1} = \alpha(1-\rho) + \beta(X_t - \rho X_{t-1}) + u_t - \rho u_{t-1} \quad (4-d)$$

The first step of the method is to regress  $Y_t$  on  $X_t$  in (4-a) to obtain the estimates  $\hat{\alpha}$  and  $\hat{\beta}$  and compute the residuals

$$\hat{u}_t = Y_t - \hat{\alpha} - \hat{\beta} X_t$$

If the residuals are not random we proceed to the second step, which consists of regressing  $\hat{u}_t$  on  $\hat{u}_{t-1}$  in (4-b) to obtain  $\hat{\rho}$ , an estimate of  $\rho$ , and transform the variables by  $\hat{\rho}$  using (4-d). In the final step we regress  $(Y_t - \hat{\rho} Y_{t-1})$  on  $(X_t - \hat{\rho} X_{t-1})$  in (4-d) to derive a new set of estimates. We compute the new set of residuals and test for randomness. If not random we go back to step two and so on until we obtain random residuals.

This iterative procedure was employed to remove the presence of autocorrelation in equations (4-6), (4-9), (4-11), (4-13), (4-24) and (4-25). The export equation derived initially was as follows:

$$E_w = -1143.57 + 10.1177 Y_{us} \quad (4-e) \\ (239.630) (0.46981)$$

$$1947-68 \quad \bar{R}^2 = 0.9566$$

$$DW = 0.2597 \quad VN = 0.2721$$

One iteration yielded the equation

$$E_w = -197.765 + 15.4291 Y_{us} \quad (4-f) \\ (74.1155) (1.69192)$$

$$1948-68 \quad \bar{R}^2 = 0.8042$$

$$DW = 2.1883 \quad VN = 2.2977$$

The estimated equation for  $Y_b$  was at first

$$Y_b = 354.336 + 0.04797 (GPP - \Delta I_b) \quad (4-g) \\ (36.2476) (0.00236)$$

$$1947-68 \quad \bar{R}^2 = 0.9517$$

$$DW = 0.4350 \quad VN = 0.4558$$

Applying one iteration yielded the result

$$Y_b = 114.901 + 0.04263 (GPP - \Delta I_b) \quad (4-h) \\ (22.3920) (0.00459)$$

$$1948-68 \quad \bar{R}^2 = 0.8100$$

$$DW = 2.0130 \quad VN = 2.1136$$

<sup>4</sup>See M. Nerlove and K. F. Wallis, "Use of the Durbin-Watson Statistic in Inappropriate Situations", *Econometrica*, Vol. 34, No. 1 (January, 1966) pp. 235-238, and J. Durbin,

"Testing for Serial Correlation in Least-Squares Regression when some of the Regressors are Lagged Dependent Variables", *Econometrica*, Vol. 38, No. 3 (May, 1970) pp. 410-421.



equation explaining  $Y_1$  was initially stated as

$$= 166.104 + 0.60645 [S_p + (S_p)_{-1}] \quad (4-37)$$

(24.4185)(0.01711)

$$1948-68 \quad \bar{R}^2 = 0.9843$$

$$W = 0.4815 \quad VN = 0.5056$$

iteration resulted in

$$= 37.2239 + 0.60846 [S_p + (S_p)_{-1}] \quad (4-11)$$

(16.7488) (0.03218)

$$1949-68 \quad \bar{R}^2 = 0.9494$$

$$W = 1.2861 \quad VN = 1.3538$$

equation for  $C_s$  before transforming the variables was

$$= 0.00812 Y_w \quad (4-38)$$

(0.00009)

$$1947-68 \quad \bar{R}^2 = 0.9976$$

$$W = 0.9595 \quad VN = 1.0052$$

one transformation we derived the equation

$$= 0.00814 Y_w \quad (4-14)$$

(0.00013)

$$1948-68 \quad \bar{R}^2 = 0.9948$$

$$W = 1.6268 \quad VN = 1.7075$$

equation for motor vehicle licences and permits without transformation read as

$$= -32.9951 + 0.04807 V_r \quad (4-39)$$

(4.45637) (0.00233)

$$1948-68 \quad \bar{R}^2 = 0.9528$$

$$W = 0.6108 \quad VN = 0.6399$$

iteration produced the result

$$= -12.7805 + 0.04962 V_r \quad (4-24)$$

(3.78574) (0.00528)

$$1948-68 \quad \bar{R}^2 = 0.8135$$

$$W = 1.6801 \quad VN = 1.7641$$

ly, the equation for profits of liquor commissions was in the first instance as follows:

$$= 42.1221 + 0.05351 \bar{Y}_p \quad (4-40)$$

(4.73522)(0.00245)

$$1948-68 \quad \bar{R}^2 = 0.9596$$

$$W = 0.4470 \quad VN = 0.4693$$

single transformation of variables gave the equation

$$= 12.5046 + 0.05157 \bar{Y}_p \quad (4-25)$$

(2.71913)(0.00400)

$$1948-68 \quad \bar{R}^2 = 0.8919$$

$$W = 1.8094 \quad VN = 1.8999$$

Looking at these results we can observe the transformation of variables had the

favourable effect of improving the values of DW and VN and thus helped to remove the serial correlation of the disturbance term in each relationship. However, after each transformation the resulting  $\bar{R}^2$  was lower and the values of the regression coefficients were altered considerably in some cases, particularly in the export equation and the consumption function, as can be seen from the following results:

The initial version of the consumption equation reads as follows:

$$C_p = 0.60864 Y_d + 0.36328 (C_p)_{-1} \quad (4-1)$$

(0.08397) (0.09815)

$$1948-68 \quad \bar{R}^2 = 0.9999$$

$$DW = 0.4082 \quad VN = 0.4286$$

After two iterations we obtained the result

$$C_p = 0.87960 Y_d + 0.02012 (C_p)_{-1} \quad (4-41)$$

(0.00646) (0.00763)

$$1950-68 \quad \bar{R}^2 = 0.9998$$

$$DW = 0.6673 \quad VN = 0.7044$$

In view of the low values for DW and VN we attempted one more iteration which gave

$$C_p = 0.87536 Y_d + 0.01655 (C_p)_{-1} \quad (4-42)$$

(0.004031) (0.00467)

$$1951-68 \quad \bar{R}^2 = 0.9997$$

$$DW = 2.1626 \quad VN = 2.2898$$

Each transformation of the consumption equation had the effect of increasing the coefficient of the income variable from 0.60864 in (4-1) to 0.87536 in (4-42), and lowering

the coefficient of the lagged consumption variable from 0.36328 to 0.01655 between the original equation (4-1) and the transformed equation (4-42). Due to this change in coefficients we are reluctant to accept equation (4-42) because it places very little importance on the influence of past consumption contrary to economic theory. We consider equation (4-1) as more reliable despite the presence of autocorrelation remembering that the DW test is not suitable in this case.

For similar reasons we have retained in the model equation (4-10) although the disturbance term fails the tests for autocorrelation.

This equation has the form

$$Y_t = 0.28207 \Delta X_t + 2.91652 P_t \quad (4-10)$$

(0.13133) (0.08833)

$$1948-68 \quad \bar{R}^2 = 0.9881$$

$$DW = 0.4306 \quad VN = 0.4521$$

An attempt to remove autocorrelation produced the result

$$Y_t = 0.02344 \Delta X_t + 0.32464 P_t \quad (4-43)$$

(0.12629) (0.36359)

$$1949-68 \quad \bar{R}^2 = 0.8096$$

$$DW = 1.9957 \quad VN = 2.1007$$

Although the transformation in (4-43) has solved the problem of autocorrelation the regression coefficients have changed dramatically in relation to their corresponding values in (4-10). Moreover both coefficients have lost their significance in (4-43). From alternative specifications of the equation for

Table 4-1 — Comparison of Parameter Values Estimated by OLS and TSLS

Dependent Variable	Explanatory Variable	Estimated Parameters		Absolute Change	Percentage Change
		OLS	TSLS		
$C_p$	$Y_d$	0.60864	0.58740	-0.02124	-3.49
$C_p$	$(C_p)_{-1}$	0.36328	0.38843	+0.02515	+6.92
$I_c$	$I_m$	0.42143	0.44138	+0.01995	+4.73
$I_c$	$(M_a)_{-1}$	0.00194	0.00201	+0.00007	+3.60
$I_c$	$(I_c)_{-1}$	0.68579	0.66785	-0.01794	-2.61
$M_w$	GPP	0.20248	0.20360	+0.00112	+0.55
$M_w$	$(C_p)_{-1}$	0.06717	0.06635	-0.00082	-1.22
$Y_w$	GPP	0.57687	0.57903	+0.00216	+0.37
$Y_w$	$L_p$	-56.2500	-53.9375	-2.3125	-4.11
$P_c$	GPP	0.11420	0.11461	+0.00041	+0.36
$P_c$	$\Delta I_b$	0.41328	0.40958	-0.00370	-0.90
$C_s$	$Y_w$	0.00814	0.00814	0.0	0.0
$T_o$	$C_p$	0.01159	0.01172	+0.00013	+1.11

$Y_t$  we have found that the price variable,  $P_t$ , has always exercised a strong positive effect on  $Y_t$ . For these reasons equation (4-43) was rejected in favour of (4-10) regardless of the presence of autocorrelation.

#### 4.5 Comparison of OLS and TSLS

##### Estimates

The adjusted coefficient of multiple determination,  $\bar{R}^2$ , has remained practically the same as we move from OLS to the TSLS estimates. The DW values obtained by the TSLS method are higher for some equations and lower for others. Generally speaking, we observe a slight increase in the standard errors of coefficients in the TSLS set, however, none of the coefficients has lost its statistical significance. The numerical values of coefficients have fluctuated between the OLS and TSLS estimates as shown in Table 4-1.

The percentage change ranges from zero to 6.9 per cent. No change has occurred in the coefficient of the variable  $Y_w$ , while the largest change was observed for the coefficient of  $(C_p)_{-1}$  in the consumption equation. In more than half of the coefficients the recorded change was less than the mean change of 2.49 per cent. The median change is 1.22 per cent which suggests that in general the magnitude of change between the OLS and TSLS estimates is small enough to be considered insignificant for all practical purposes.

#### 4.6 The Estimated Consumption Equation

In the specification of the consumption function we imposed the *a priori* restriction  $\beta_1 + \gamma_1 = 1$  on the coefficients on the basis of the Ball and Drake theory. Looking at the numerical values of the estimated parameters we observe that this restriction is, in fact, satisfied since in equation (4-1) estimated by OLS we have  $\beta_1 + \gamma_1 = 0.97192$ , whereas in equation (4-28) estimated by TSLS we obtain  $\beta_1 + \gamma_1 = 0.99583$  which is even closer to one.

From the estimated consumption equations (4-1) and (4-28) we can derive numerical values for the income elasticity and the marginal propensity to consume. The short-run marginal propensity to consume measures the change in consumption resulting from a unit change in income, *ceteris paribus*, and it is given by the coefficient of the income variable which represents the partial derivative of current consumption with respect to current income. To compute the long-run marginal propensity to consume we must make allow-

ance for the second explanatory variable  $(C_p)_{-1}$  in the consumption function, which measures habit formation of consumers. This propensity is calculated at the stationary point  $C_p = (C_p)_{-1}$ .

Numerical values for the short and long-run marginal propensities to consume based on the OLS and TSLS consumption equations are shown in Table 4-2.

Table 4-2 – Short-run and Long-run Marginal Propensities to Consume

	Short-run	Long-run
OLS	0.6086	0.9559
TSLS	0.5874	0.9605

As can be seen in this Table there is a close agreement between the OLS and TSLS propensities. The long-run propensities are higher relative to the short-run which is in accordance with *a priori* expectations based on economic theory. These propensities indicate that for each additional dollar of income earned net of taxes, Ontarians spend 60 cents on personal consumption while in the long-run they tend to spend about 96 cents.

Using the marginal propensities to consume we can calculate the short-run and long-run partial income elasticities which measure the percentage change in consumption resulting from a change of one per cent in disposable income. These elasticities com-

puted at the point of sample means are given in Table 4-3.

Table 4-3 – Short-run and Long-run Partial Income Elasticities

	Short-run	Long-run
OLS	0.6580	1.0350
TSLS	0.6350	1.0350

As in the case of propensities, we observe in Table 4-3 a close correspondence between the OLS and TSLS elasticities with the long-run elasticities much greater in value than the short-run. These figures suggest that a one per cent change in income will result in about the same change in consumption in the long-run and about two-thirds of one per cent in the short-run.

Further experiments with the consumption function were carried out utilizing current and past levels of income as explanatory variables. The results of these experiments are presented in Table 4-4. The goodness of fit is very high in all equations, as is common in the case with estimated consumption functions, however, the DW values are quite low. All coefficients in this Table are statistically significant with the exception of the coefficient attached to the lagged income variable in equation (4-44). This variable was introduced in (4-44) and (4-48) in an attempt to disentangle the interdepen-

Table 4-4 – Equations for Personal Consumption Expenditure,  $C_p$ , 1948-68  
OLS Estimates

Equation	Explanatory Variables				Constant Term	$\bar{R}^2$	DW
	$(C_p)_{-1}$	$(Y_d)_{-1}$	$\Delta Y_d$	$Y_d$			
(4-44)	0.92188 (0.37270)	0.13672 (0.34380)				0.9995	0.85
(4-45)		0.89172 (0.00163)	0.83487 (0.01596)		362.843 (10.1463)	0.9999	0.85
(4-46)		0.05713 (0.01730)		0.83447 (0.01600)	362.805 (10.1840)	0.9999	0.85
(4-47)	1.00012 (0.00035)		0.86615 (0.00302)		12.5625 (2.00187)	0.9999	1.00
(4-48)		0.95759 (0.01253)			354.117 (122.133)	0.9966	1.00



of the model. Equation (4-48) will be eventually in the recursive model which, mentioned in Section 3.19, results from the model after the consumption equation is replaced by either (4-44) or (4-48). The import function is re-specified to include  $(GPP)_{-1}$  rather than GPP as an explanatory variable.

The forecasting ability of the estimated consumption equations can be roughly evaluated by comparing point forecasts with the value of  $C_p$  in 1969 as shown in Table 4-5. The forecasting performance of equation (4-28), which overestimates consumption by 1.12 per cent, is superior relative to equation (4-1) with transformed variables, which overestimates  $C_p$  by 1.12 per cent. The equation (4-28) performs slightly better than the OLS equation (4-1). The best forecast is obtained from equation (4-47) where the forecast error is only 0.35 per cent. The worst forecast results from equation (4-2) but this is not surprising in view of the fact that the coefficient of the income variable is not statistically significant.

#### Table 4-5 — Point Forecasts of $C_p$ for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-1)	18111	18303	-1.06
(4-2)	18111	17909	+1.12
(4-3)	18111	18293	-1.00
(4-4)	18111	17847	+1.46
(4-5)	18111	18226	-0.64
(4-6)	18111	18223	-0.62
(4-7)	18111	18175	-0.35
(4-8)	18111	17955	+0.86

The results in Table 4-5 provide only a partial test of the forecasting ability of alternative consumption functions. It must be emphasized that a single observation beyond the sample of fit is not sufficient to evaluate the predictive power of an equation either initially or within the context of the entire sample.

#### The Equation for Investment in Machinery and Equipment

The statistical criteria of goodness of fit, the absence of autocorrelation in the residuals, and the significance of coefficients are well satisfied by equation (4-2). The predictive ability of equation (4-2) within the sample period is shown in Table 4-6. The prediction error varies from 0.11 per cent in 1959 to 13.65

per cent in 1963. The equation predicts correctly the slack in  $I_m$  in 1954 and 1958 and the upturn in business investment during the period 1962-66, but it fails to predict the direction of change in 1961, 1967 and 1968.

At this stage we decided to perform additional experiments with explanatory variables denoting past levels of GPP and year-to-year changes in factory shipments. An attempt was also made to introduce Canadian GNP into the regressions to capture the influence of economic activity at the national level on the Ontario economy. Four equations selected

from a wider range of results are presented in Table 4-7. The DW value is very low in all equations, except (4-50), indicating the presence of serial correlation in the disturbance terms. Moreover, the GNP variable is insignificant in (4-51) and the coefficient of lagged GPP in (4-52) has the wrong sign. A residual analysis of equation (4-50), similar to Table 4-6 indicated that the direction of change in  $I_m$  predicted by this equation was the same as the one predicted by equation (4-2), but the magnitude of change was greater.

Table 4-6 — Actual and Predicted Values of the Dependent Variable,  $I_m$ , in Equation (4-2), 1948-68

Year	Actual Value	Predicted Value	Residuals	Prediction Error (%)
1948	442	472	-30	-6.79
1949	457	432	25	5.47
1950	494	512	-18	-3.64
1951	685	640	45	6.57
1952	677	666	11	1.62
1953	747	749	-2	-0.27
1954	699	642	57	8.15
1955	704	730	-26	-3.69
1956	948	886	62	6.54
1957	1059	995	64	6.04
1958	842	851	-9	-1.07
1959	879	878	1	0.11
1960	922	927	-5	-0.54
1961	877	967	-90	-10.26
1962	983	997	-14	-1.42
1963	1055	1199	-144	-13.65
1964	1345	1321	24	1.78
1965	1674	1636	38	2.27
1966	1975	1920	55	2.78
1967	1998	1905	92	4.60
1968	1895	2018	-123	-6.49

Table 4-7 — Equations for Investment in Machinery and Equipment,  $I_m$ , 1948-68  
OLS Estimates

Equation	Explanatory Variables					$\bar{R}^2$	DW
	$(P_c)_{-1}$	$(I_m)_{-1}$	$(GPP)_{-1}$	$\Delta S_t$	GNP		
(4-49)		0.57436 (0.24384)	0.03551 (0.01765)			0.9864	1.2486
(4-50)	0.26853 (0.09115)	0.53253 (0.14021)		0.11111 (0.03584)		0.9944	1.4255
(4-51)	0.59538 (0.24632)				0.00186 (0.01072)	0.9890	0.6368
(4-52)	0.68994 (0.18958)		-0.01700 (0.02268)			0.05134 (0.01721)	0.9925 0.9069

The forecasting performance of the estimated equations for  $I_m$  is shown in Table 4-8. The forecast error ranges from 3.69 per cent in equation (4-2) to 23.60 per cent in (4-52). It is interesting to note in Table 4-8 that the forecast error is positive in every case, which indicates that the forecasts underestimate the true value of  $I_m$  in 1969. This may be explained by the fact that business investment in machinery and equipment increased by \$380 million in 1969 relative to 1968, which was the largest increase since 1948. It is not surprising, therefore, that none of the equations were able to predict this dramatic upsurge in  $I_m$ , the magnitude of which had not occurred in the sample period.

Table 4-8 — Point Forecasts of  $I_m$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-2)	2275	2191	+3.69
(4-49)	2275	2101	+7.65
(4-50)	2275	1981	+12.92
(4-51)	2275	2032	+10.68
(4-52)	2275	1738	+23.60

Table 4-11 — Actual and Predicted Values of the Dependent Variable  $I_c$  in Equations (4-3) and (4-29), 1948-68

Year	Actual Value	Predicted Value		Prediction Error (%)	
		OLS	TSLS	OLS	TSLS
1948	525	541	559	-3.05	-1.76
1949	625	636	628	-1.76	-1.76
1950	739	721	730	2.44	2.44
1951	842	880	864	-4.51	-4.51
1952	864	950	947	-9.95	-9.95
1953	1031	995	998	3.49	3.49
1954	1090	1091	1064	-0.09	-0.09
1955	1224	1131	1141	7.60	7.60
1956	1453	1325	1298	8.81	8.81
1957	1620	1532	1503	5.43	5.43
1958	1719	1557	1551	9.42	9.42
1959	1464	1638	1628	-11.89	-11.89
1960	1395	1483	1480	-6.30	-6.30
1961	1342	1415	1449	-5.44	-5.44
1962	1363	1421	1426	-4.26	-4.26
1963	1469	1465	1529	0.27	0.27
1964	1709	1662	1655	2.75	2.75
1965	1845	1972	1961	-6.88	-6.88
1966	2258	2197	2183	2.70	2.70
1967	2376	2496	2458	-5.05	-5.05
1968	2681	2541	2594	5.22	5.22

Table 4-9 — Equations for Investment in Construction,  $I_c$ , 1948-68  
OLS Estimates

Equation	Explanatory Variables			Constant Term	$\bar{R}^2$	DW
	$I_m$	$(I_c)_{-1}$	$Y_d + (Y_d)_{-1} + (Y_d)_{-2}$			
(4-53)	0.42355 (0.09937)	0.74558 (0.07953)			0.9956	1.8445
(4-54)	0.47670 (0.13476)		0.02696 (0.01010)	204.930 (108.045)	0.8997	0.5638
(4-55)	0.47514 (0.12123)	0.80992 (0.11670)	-0.00508 (0.00667)		0.9955	2.0666

Table 4-10 — Matrix of Zero-Order Correlation Coefficients

$I_c$	$I_m$	$(I_c)_{-1}$	$(M_a)_{-1}$	$Y_d + (Y_d)_{-1} + (Y_d)_{-2}$
1.0000	0.9368	0.9708	0.8714	0.9425
	1.0000	0.8796	0.8548	0.9184
		1.0000	0.8335	0.9437
			1.0000	0.7901
				1.0000

In other specifications, not reported, the current level of income,  $Y_d$ , was used in the estimated coefficient although significant, but had the wrong sign.

#### 4.8 The Equation for Investment in Construction

The numerical values of coefficients in the OLS equation (4-3) are quite close in magnitude with those in the TSLS equation (4-29). These equations are free from autocorrelation and possess the same explanatory power. The demographic variable,  $(M_a)_{-1}$ , is statistically significant in either equation. Table 4-9 shows three regression equations in which  $(M_a)_{-1}$  was replaced by a variable representing the sum of current and two previous levels of income.

The income variable is significant in the OLS equations with two explanatory variables (4-54), but loses its significance in the TSLS variable regressions as in (4-55). This multicollinearity arises because the independent variables are highly collinear as indicated by the high order correlation matrix in Table 4-10.

The predictive power of the OLS and TSLS equations of the model within



sample period can be judged from the results in Table 4-11. Both equations predict correctly the direction of change in  $I_e$  during the upswing in building activity in the periods 1948-58 and 1962-68. The turning point in the building cycle, which occurred in 1959, is predicted by the equations with a time lag of one year. The prediction error of the OLS equation ranges from 0.27 per cent in 1963 to 1.89 per cent in 1959. The smallest error in the TSLS equation occurs in 1949 and the largest in 1959. Relatively large errors result in both equations in the years 1952, 1956, 1958 and 1959.

Point forecasts for the year 1969 are shown in Table 4-12. Equation (4-3) estimated by OLS performs slightly better relative to the TSLS equation (4-29). The smallest forecast error occurs in equation (4-55) but the negative coefficient of the income variable leads to the rejection of the result on economic grounds. Equation (4-53) does quite well depending on its performance in subsequent years it may prove to be a good forecasting relationship.

Table 4-12 — Point Forecasts of  $I_e$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-3)	2972	2933	+1.31
(4-9)	2972	2912	+2.01
(4-33)	2972	2962	+0.34
(4-4)	2972	2582	+13.12
(4-5)	2972	2970	+0.07

#### Changes in Non-farm Business Inventories

Changes in business inventories can hardly be explained with annual models. Among the regression relationships equation (4-5) was selected, which explains 74 per cent of the variation in  $\Delta I_b$ . Although the residuals are not serially correlated only one of these estimated parameters is significant. This equation forecasts \$245 million change in business inventories between 1968 and 1969 which underestimates the actual change of \$297 million by 17.51 per cent.

#### Changes in Farm Inventories

Equation (4-5) for  $\Delta I_f$  is the weakest in the model. Two of the estimated parameters are statistically significant, namely, the

constant term and the coefficient of  $(I_f)_{-1}$ . The coefficients of the variables  $P_f$  and  $X_f$  are almost significant at the conventional 5 per cent probability level. Although the equation is free from autocorrelation the value of  $\bar{R}^2$  is exceedingly low explaining no more than 25 per cent of the variation in the dependent variable.

A considerable amount of experimentation was carried out, in an attempt to increase the explanatory power of the equation which, however, failed to produce satisfactory results. The movements of  $\Delta I_f$  over the sample period have been very erratic beyond the point where they can be accurately predicted.

#### 4.11 The Estimated Export Equation

Equations (4-35) and (4-6) explain Ontario exports to the rest of the world,  $E_w$ . In equation (4-6) the iteration method of variable transformation was employed to remove autocorrelation. For reasons discussed in Section 3.7 the export equation has been misspecified by excluding relative prices (export price index/domestic price index). Using the foreign exchange rate between U.S. and Canadian currency as a proxy for relative prices we estimated the equation

$$E_w = -5081.44 + 41.0142 F_x + 9.55038 Y_{us} \quad (4-56)$$

(1792.85) (18.8626) (0.55278)

$$1948-68 \quad \bar{R}^2 = 0.9624$$

$$DW = 0.4878 \quad VN = 0.5122$$

where  $F_x$  denotes the ratio of Canadian to U.S. dollars expressed as a percentage.

All coefficients in (4-56) are significant and  $\bar{R}^2$  is high but the DW value is very low indicating positive autocorrelation in the residuals.

Forecasts derived from the export equations are shown in Table 4-13. Equation (4-6) with transformed variables provides a poor forecast relative to (4-35), whereas equation (4-56) predicts slightly better.

Table 4-13 — Point Forecasts of  $E_w$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-6)	9318	14186	-52.24
(4-35)	9318	8289	+11.04
(4-56)	9318	8334	+10.56

#### 4.12 The Estimated Import Equation

The demand for Ontario imports from abroad is explained by equation (4-7) estimated by the OLS method and equation (4-30) estimated by TSLS. Both equations contain highly significant coefficients and possess exceptionally high explanatory power. The VN values provide assurance that autocorrelation does not exist.

The short-run marginal propensity to import resulting from equations (4-7) and (4-30) is approximately 0.203. The short-run and long-run partial income elasticities, computed at the point of sample means are given in Table 4-14. In the short-run the income elasticity is about 0.84 and rises in the long-run to about 0.90.

Table 4-14 — Short-run and Long-run Partial Income Elasticities

	Short-run	Long-run
OLS	0.8389	0.8993
TSLS	0.8435	0.9035

In addition to (4-7) and (4-30) three alternative import equations were estimated by OLS as follows:

$$M_w = 0.26136 (GPP)_{-1} \quad (4-57)$$

(0.00141)

$$1948-68 \quad \bar{R}^2 = 0.9994$$

$$DW = 1.7852 \quad VN = 1.8744$$

$$M_w = 26.6250 + 0.18288 GPP + 0.25366 (M_w)_{-1} \quad (4-58)$$

(16.8144) (0.01213) (0.05562)

$$1948-68 \quad \bar{R}^2 = 0.9996$$

$$DW = 2.1396 \quad VN = 2.2465$$

$$M_w = 494.000 + 0.24025 GPP - 4.67969 F_x \quad (4-59)$$

(196.125) (0.00162) (2.03443)

$$1948-68 \quad \bar{R}^2 = 0.9994$$

$$DW = 1.3505 \quad VN = 1.4180$$

The regression coefficients are highly significant with the exception of the constant term in equation (4-58).  $\bar{R}^2$  is exceptionally high and the measures of first-order autocorrelation suggest randomness in the residuals.

The forecasting performance of the import equations beyond the sample period is excellent as can be seen from the results reported in Table 4-15. The magnitude of the

forecast error is quite small ranging from 0.01 to 1.86 per cent.

Table 4-15 — Point Forecasts of  $M_w$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-7)	7594	7653	-0.78
(4-30)	7594	7673	-1.04
(4-57)	7594	7453	+1.86
(4-58)	7594	7558	+0.47
(4-59)	7594	7595	-0.01

#### 4.13 The Estimated Equation for Wages and Salaries

Equations (4-8) and (4-31) explaining  $Y_w$  are quite satisfactory from the statistical point of view. The TSLS equation might be preferred over the OLS equation because of the higher DW and VN values. The negative coefficient of the variable  $L_p$  in both equations is justified on theoretical grounds since it measures the cyclical effects on  $Y_w$ . As the percentage of labour employed goes up in the upswing unskilled workers whose average earnings are less than those already employed enter the labour force<sup>5</sup>. The converse is the case in the downswing of the cycle.

Forecasts for 1969 obtained from these equations are shown in Table 4-16. The TSLS equation gives a better forecast compared with the OLS equation. However, the difference between the two forecasts is not very great in magnitude.

Table 4-16 — Point Forecasts of  $Y_w$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-8)	18216	17849	+2.01
(4-31)	18216	17901	+1.73

Wages and salaries of Ontario employees may be affected by development at the national level. To test this hypothesis we fitted a number of regressions using national variables on the right-hand side. Table 4-17 presents four equations selected from these experiments.

Table 4-17 — Equations for Wages and Salaries,  $Y_w$ , 1948-68  
OLS Estimates

Explanatory Variables						Constant Term	$\bar{R}^2$
Equation	GPP	$L_e$	GNP	$NY_w$	$L_p$		
(4-60)	0.54858 (0.03333)	0.60938 (0.65800)				-1344.00 (963.463)	0.9991
(4-61)	0.48755 (0.08813)		0.03613 (0.03488)			-460.687 (59.1164)	0.9992
(4-62)	0.03125 (0.10895)			0.47095 (0.09433)		653.000 (62.0256)	0.9995
(4-63)	0.03125 (0.06622)			0.47388 (0.05740)	-6.91406 (0.41191)		0.9999

The coefficient of  $L_e$  in (4-60) lacks significance. The same is true for the coefficient of GNP in (4-61). The variable  $NY_w$  in equations (4-62) and (4-63), denoting wages and salaries at the national level, is statistically significant but its inclusion in the regression forces the GPP variable to lose its significance. In general, we have observed in a number of experiments strong multicollinearity between provincial and national variables which makes it impossible to measure their separate effect on the dependent variable.

#### 4.14 The Equation for Unincorporated Business Income

It was mentioned in Section (4-4) that equation (4-9) was obtained from (4-36) after a transformation of variables to remove serial correlation in the residuals. The 1969 forecasts for  $Y_b$  generated by these equations are given in Table 4-18.

Table 4-18 — Point Forecasts of  $Y_b$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-9)	1751	1451	+17.13
(4-36)	1751	1858	-6.11

Evidently, equation (4-36) produces a better forecast regardless of autocorrelation. An attempt to improve upon (4-36) by introducing a time trend gave the following result:

$$Y_b = 430.035 + 0.02349 (GPP - \Delta I_t) + 25.500 t$$

(36.3806) (0.00775) (8.10380)

$$1948-68 \quad \bar{R}^2 = 0.9658$$

$$DW = 0.6755 \quad VN = 0.7092$$

Although the autocorrelation problem remains unsolved equation (4-64) yields a forecast value of 1691 which is only 1.1 per cent off the mark.

#### 4.15 Income of Farm Operators from Farm Production

In equation (4-10) both coefficients are significant and the goodness of fit is quite satisfactory but the DW value is exceeding indicating the presence of positive correlation of the disturbances. Various hypotheses were tested, about the causal factors of  $Y_f$ , but the results were unsatisfactory. Equation (4-10) provides a 1969 forecast for  $Y_f$  of the order of \$394 million compared to the actual level of \$450 million. The forecast error is 12.44 per cent.

#### 4.16 Interest, Dividends and Miscellaneous Investment Income

The endogenous variable  $Y_i$  is explained in equations (4-11) and (4-37). The coefficients of the savings variable are of the order of magnitude in both equations. However, the constant term is much lower in equation (4-11) with transformed variables. The significance of this change in the real value of the constant can be evaluated in the light of the 1969 forecasts of

<sup>5</sup>See L. H. Officer. *An Econometric Model of Canada under the Fluctuating Exchange Rate*, Harvard University Press, Cambridge, Massachusetts, 1968, p. 95.



Table 4-19 — Point Forecasts of  $Y_1$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-37)	2167	2221	-2.49
(4-41)	2167	2098	+3.18

The forecast of equation (4-37) with larger constant overstates the true value of  $Y_1$  by 2.49 per cent, whereas equation (4-41) with the smaller constant term understates the actual value by 3.18 per cent.

#### The Estimated Equation for Corporate Profits

The corporate profits equation was estimated by OLS and TSLS. The OLS equation (4-37) originally included a constant term, which was subsequently dropped because its standard error was large relative to its value. Consequently, the TSLS equation (4-32) was estimated with a suppressed constant. The regression coefficients are highly significant in both equations and the values of  $\bar{R}^2$  are exceptionally high explaining more than 99 per cent of the variation in  $P_c$ . The DW values fall into the inconclusive range whereas the  $VN$  values indicate the absence of autocorrelation.

Other specifications utilizing national variables failed to produce satisfactory results. The most acceptable equation included profits of Canadian corporations  $NP_c$  as follows:

$$P_c = 0.03984 GPP + 0.28032 NP_c \quad (4-65) \\ (0.01556) \quad (0.05495)$$

$$1962-68 \quad \bar{R}^2 = 0.9978$$

$$DW = 1.0668 \quad VN = 1.1176$$

The DW value indicates the existence of positive autocorrelation but the  $VN$  test is satisfied at the one per cent level of significance.

Table 4-20 contains forecasts of  $P_c$  beyond the observation period derived from equations (4-12), (4-32) and (4-65).

Table 4-20 — Point Forecasts of  $P_c$  for 1969

Equation	Actual Value	Forecast Value	Forecast Error (%)
(4-12)	3298	3743	-13.49
(4-32)	3298	3755	-13.86
(4-65)	3298	3464	-5.03

The forecast of (4-65) is superior relative to the forecasts of (4-12) and (4-32).

**4.18 The Equation for Corporate Dividends**  
Equation (4-13) explaining dividend payments of Ontario corporations stands up to all statistical tests. The predictive power of this equation within and beyond the period of fit is remarkable. The 1969 forecast value for  $D_v$  is \$829 million which comes quite close to the actual value of \$831 million.

#### 4.19 Contributions to Social Insurance and Pension Funds

Equations (4-33) and (4-14) explaining  $C_s$  contain identical parameter values and yield identical forecasts for 1969. The forecast value for  $C_s$  is \$148 million relative to the true value of \$139 million.

#### 4.20 The Personal Income Tax Equations

The personal income tax sub-model consists of the identities (3-34) to (3-41) reported in the previous Chapter and the estimated statistical relationships (4-15) to (4-18). The stochastic equations have been estimated by OLS on the basis of seven observations for the period 1962-68. Due to the small size of sample the measures of first-order autocorrelation are not applicable.

The total number of taxable returns of individuals,  $N_r$ , is explained by equation (4-18),<sup>6</sup> whereas the number of taxable returns in the  $i$ th income class,  $(N_r)_i$ , can be obtained from identities (3-40) and (3-41), given the proportion  $(P_r)_i$  of taxable returns in each income class. These proportions have exhibited a systematic trend over the sample period as can be seen in Table 4-21. The proportions  $(P_r)_3$  and  $(P_r)_4$  of the two upper income classes are monotonically increasing

Table 4-21 — Proportion of Taxable Returns in the  $i$ th Income Class, 1962-68

Year	$(P_r)_1$	$(P_r)_2$	$(P_r)_3$	$(P_r)_4$
1962	0.295	0.391	0.271	0.043
1963	0.296	0.374	0.284	0.046
1964	0.278	0.353	0.319	0.050
1965	0.265	0.327	0.351	0.057
1966	0.250	0.306	0.376	0.068
1967	0.232	0.287	0.399	0.082
1968	0.216	0.259	0.424	0.101

whereas the proportion  $(P_r)_2$  of the second income class is a monotonically decreasing function of time. Hence, these proportions

can be forecast beyond 1968 on the basis of a time trend using the following equations:

$$(P_r)_2 = 0.41629 - 0.02204 t \quad (4-66) \\ (0.00241) \quad (0.00054)$$

$$1962-68 \quad \bar{R}^2 = 0.9964 \\ DW = 2.1559 \quad VN = 2.5152$$

$$(P_r)_3 = 0.23971 + 0.02664 t \quad (4-67) \\ (0.00447) \quad (0.00099)$$

$$1962-68 \quad \bar{R}^2 = 0.9916 \\ DW = 2.1689 \quad VN = 2.5304$$

$$(P_r)_4 = 0.02614 + 0.00943 t \quad (4-68) \\ (0.00573) \quad (0.00128)$$

$$1962-68 \quad \bar{R}^2 = 0.8986 \\ DW = 0.8344 \quad VN = 0.9735$$

Since  $(N_r)_1$  is obtained as a residual from identity (3-40) the proportion  $(P_r)_1$  is not required for forecasting purposes.

Total personal income assessed,  $Y_a$ , of Ontario taxpayers is explained by equation (4-16).<sup>7</sup> Personal income assessed in the first income class,  $(Y_a)_1$ , is derived residually from identity (3-36). Personal income assessed in the second, third and fourth income classes is obtained from (3-37) given the proportions  $(P_y)_2$ ,  $(P_y)_3$ , and  $(P_y)_4$ . The values of these proportions for the period 1962-68 are shown in Table 4-22. As in the case of  $(P_r)_i$  we observe in Table 4-22 that the proportions  $(P_y)_i$  have moved systematically over time and, therefore, can be easily predicted beyond the sample period from the equations (4-69), (4-70) and (4-71).

Table 4-22 — Proportion of Assessed Income in the  $i$ th Income Class, 1962-68

Year	$(P_y)_1$	$(P_y)_2$	$(P_y)_3$	$(P_y)_4$
1962	0.133	0.333	0.376	0.158
1963	0.132	0.317	0.390	0.161
1964	0.118	0.287	0.422	0.173
1965	0.108	0.255	0.450	0.187
1966	0.096	0.228	0.468	0.208
1967	0.084	0.202	0.478	0.236
1968	0.073	0.171	0.487	0.269

$$(P_y)_2 = 0.36686 - 0.02768 t \quad (4-69) \\ (0.00350) \quad (0.00078)$$

$$1962-68 \quad \bar{R}^2 = 0.9952 \\ DW = 2.0329 \quad VN = 2.3718$$

<sup>6</sup>In equation (4-18)  $N_r$  is regressed on past levels of employment. Regressing  $N_r$  on current  $L_e$  results in the OLS equation

$$N_r = 0.79117 L_e - 85.9579 t \\ (0.01149) \quad (6.60161)$$

$$\bar{R}^2 = 0.9999 \quad VN = 2.0055$$

<sup>7</sup>Assessed income specified as a function of current personal income leads to the following OLS estimate

$$Y_a = -3920.25 + 1.13615 Y_p \\ (321.027) \quad (0.02189)$$

$$\bar{R}^2 = 0.9998 \quad VN = 3.3124$$

$$(P_y)_3 = 0.35943 + 0.01982 t \quad (4-70)$$

$$(0.00797) (0.00178)$$

$$1962-68 \quad \bar{R}^2 = 0.9534$$

$$DW = 1.0482 \quad VN = 1.2223$$

$$(P_y)_4 = 0.12486 + 0.01850 t \quad (4-71)$$

$$(0.01008) (0.00225)$$

$$1962-68 \quad \bar{R}^2 = 0.9170$$

$$DW = 0.8562 \quad VN = 0.9989$$

Total tax exemptions and deductions claimed by Ontario taxpayers are determined stochastically from the estimated equation (4-17). This can be broken down by income class using identities (3-38) and (3-39). The proportions of tax exemptions and deductions in the four income classes for the period 1962-68 are given in Table 4-23.

Table 4-23 – Proportion of Tax Exemptions and Deductions in the *i*th Income Class, 1962-68

Year	$(P_x)_1$	$(P_x)_2$	$(P_x)_3$	$(P_x)_4$
1962	0.189	0.389	0.343	0.074
1963	0.190	0.368	0.364	0.078
1964	0.175	0.336	0.402	0.087
1965	0.165	0.300	0.435	0.100
1966	0.156	0.269	0.457	0.118
1967	0.143	0.241	0.472	0.144
1968	0.134	0.211	0.483	0.172

These proportions can be forecast on the basis of the following equations:

$$(P_x)_2 = 0.42414 - 0.03054 t \quad (4-72)$$

$$(0.00312) (0.00070)$$

$$1962-68 \quad \bar{R}^2 = 0.9969$$

$$DW = 1.9107 \quad VN = 2.2292$$

$$(P_x)_3 = 0.32643 + 0.02414 t \quad (4-73)$$

$$(0.00868) (0.00194)$$

$$1962-68 \quad \bar{R}^2 = 0.9624$$

$$DW = 1.1332 \quad VN = 1.3221$$

$$(P_x)_4 = 0.04514 + 0.01632 t \quad (4-74)$$

$$(0.00889) (0.00199)$$

$$1962-68 \quad \bar{R}^2 = 0.9172$$

$$DW = 0.8128 \quad VN = 0.9483$$

The weighted average basic tax rate  $(W_r)_i$  for the *i*th income class is defined in identity (3-35). These rates computed from taxation statistics for the period 1962-68 are given in Table 4-24.

Table 4-24 – Weighted Average Basic Tax Rates of the *i*th Income Class, 1962-68

Year	$(W_r)_1$	$(W_r)_2$	$(W_r)_3$	$(W_r)_4$
1962	0.11119	0.12565	0.15234	0.27780
1963	0.11200	0.12711	0.15322	0.27559
1964	0.11238	0.12809	0.15337	0.27743
1965	0.11229	0.12906	0.15588	0.27585
1966	0.11241	0.12992	0.15961	0.27267
1967	0.11231	0.13067	0.15945	0.27035
1968	0.11284	0.13138	0.16271	0.26909

Using the average tax rates of Table 4-24 and identities (3-33) and (3-34) we derive personal income tax accruals,  $T_p^*$  which serves as an explanatory variable in equation (4-15) for personal income taxes. The estimated coefficient of  $T_p^*$  is greater than unity in accordance with *a priori* expectations.

#### 4.21 The Estimated Equations for Corporate Taxes

Equations (4-19) and (4-20) explain corporate direct taxes and corporate taxable income respectively. These equations were estimated by OLS for the period 1958-67 since the 1968 observation on  $Y_c$  was not available at the time of estimation.<sup>8</sup>

#### 4.22 The Equation for Gasoline Taxes

The gasoline tax is explained by equation (4-21). The degree of explanation is exceptionally good and the estimated parameter is highly significant.

#### 4.23 The Equation for Retail Sales Taxes

Equation (4-22) for retail sales taxes was estimated for the period 1961-68 since the tax was initially introduced in Ontario in 1961. The estimated coefficient of  $T_s^*$  is less than one as anticipated on *a priori* reasoning.

#### 4.24 The Equation for Hospital Insurance Premiums

This revenue component is determined by equation (4-23) which was estimated for the period 1959-68. The resulting coefficient is significant and less than unity, whereas the value of  $\bar{R}^2$  is quite good.

#### 4.25 Motor Vehicle Licences and Permits

The estimated equation (4-24) for  $V_m$  was derived from (4-39) after a transformation of variables to eliminate first-order autocorrela-

tion in the residuals. Although the coefficient of  $V_r$  has approximately the same value, a constant term has been significantly retained in (4-24) relative to (4-39). For forecasting purposes equation (4-39) might be preferred in view of its higher  $\bar{R}^2$ .

#### 4.26 Profits of Liquor Commissions

The variable  $P_b$  is explained in equation (4-25) in terms of per capita personal income. An alternative specification was estimated with the number of adult population,  $N_p$ , as an explanatory variable, with the result

$$P_b = -151.817 + 0.05849 N_p \quad (17.0744)(0.00477)$$

$$1947-68 \quad \bar{R}^2 = 0.8767$$

$$DW = 0.1844 \quad VN = 0.1932$$

The coefficients are highly significant but the DW value is very poor. An attempt to include both  $N_p$  and  $Y_p$  into the regression produced unacceptable results with a non-significant estimated parameter for  $N_p$ .

#### 4.27 The Estimated Equation for Other Indirect Taxes

The variable for other indirect taxes was specified as a function of  $C_p$  which is exogenous to the model. For this reason the equation for  $T_o$  was estimated by OLS (4-26) as well as by TSLS (4-34). The numerical estimates are quite similar in these equations.

#### 4.28 The Equation for Government Investment Income

Finally, government investment income was determined by equation (4-27) with personal government expenditure as an explanatory variable. The equation fails the DW test but stands up to the VN test at the 0.05 per cent level of significance.

### CONCLUDING REMARKS

In this study we have presented a four-equation econometric model for the Ontario economy which can be used for policy analysis and forecasting purposes.

The model permits the evaluation of policies relating to a proposed change in the tax rates and other instrument variables by tracing the chain reactions resulting from such a change on the entire model. Finally, the policy evaluation feature of the model will be greatly enhanced with the simulation of its structure in the computer and the computation of its impact multi-

<sup>8</sup>In equation (4-20)  $Y_c$  can alternatively be specified in terms of current profits yielding the equation

$$Y_c = 511.671 + 0.56223 P_c$$

$$(63.9508) (0.02841)$$

$$\bar{R}^2 = 0.9775 \quad VN = 2.7091$$



With respect to forecasting it must be emphasized that the model has a considerable degree of flexibility and can be collapsed to a smaller size depending on the requirements of a particular analyst. For example, if the analyst is only interested in forecasting GPP and its major components he can select from a variety of results seven statistical relationships explaining the components and the GPP identity. If his interest lies in the determination of personal income he will select the personal income identity and four statistical relationships for the components. If he wishes to recast any of the government revenue

components, such as personal income taxes, corporate taxes, etc., he can use the sub-model pertaining to that component, and so on. A collapsed version of the model aimed at forecasting, currently under development in the Economic Analysis Branch will appear in a forthcoming issue of the *Ontario Economic Review*.

While discussing our results of regression analysis we pointed out the merits and demerits of each individual relationship on the basis of statistical and economic criteria. These relationships must be looked upon as integral parts of the model, therefore, their

validity depends on the performance of the model as a whole. In the final analysis the overall evaluation of the model can only be based upon its ability to provide reliable answers to complex questions relating to forecasting and economic policy.

In conclusion, the design of an econometric model is a continuing process involving constant updating, modification and improvement of its structure as more statistical and other information becomes available. Thus the present model should not be considered as a final product but as a first approximation of the Ontario economic system.

## SPECIFICATION ERRORS IN ECONOMETRICS

When we discussed the foreign trade equations of the Ontario model we indicated that because of lack of data on price indexes the price variable was omitted. This introduces a specification error since we know the correct hypothesis but because of lack of appropriate information we proceed to estimate on the basis of an incorrect hypothesis.

It is interesting to know whether there is a relationship between the coefficients of the correct and incorrect specification in order to obtain a measure of the bias introduced by using the latter. Such a relationship has been established by H. Theil<sup>1</sup>.

Let us assume that the following hypothesis is correct

$$Y = X\beta + u \quad (A-1)$$

where  $Y$  is an  $n \times 1$  vector of observations on the dependent variable

$X$  is an  $n \times k$  matrix of observations on the explanatory variables

$\beta$  is a  $k \times 1$  vector of the unknown parameters

$u$  is an  $n \times 1$  vector of unobserved disturbances.

Suppose further that the following assumptions of the model hold:

$$E(u) = 0$$

$$E(uu') = \sigma^2 I$$

$X$  is a set of non-stochastic elements

$X$  has rank  $k < n$ .

Given this hypothesis the best linear unbiased estimator of  $\beta$  is given by

$$\hat{\beta} = (X'X)^{-1} X'Y \quad (A-2)$$

Suppose now that because we are ignorant of the correct hypothesis, or because we attempt to overcome multicollinearity problems, we do not use  $X$  as the matrix of explanatory variables but a different matrix  $X_x$  of order  $n \times r$ , where  $r < k$ , so that  $k - r$  explanatory variables are omitted from the regression.

This incorrect specification amounts to replacing (A-1) by

$$Y = X_x \beta_x + u_x \quad (A-3)$$

Subtracting (A-3) from (A-1) we obtain

$$X\beta - X_x \beta_x + u - u_x = 0$$

Thus  $u_x = X\beta - X_x \beta_x + u$

and  $E(u_x) = X\beta - X_x \beta_x \neq 0$

Since  $E(u) = 0$  and  $X_x$  is assumed to be fixed.

In general the expected value of  $u_x$  will be different from zero, regardless of the  $\beta_x$ 's.

Let us assume that we apply least-squares to (A-3) and obtain the result

$$\hat{\beta}_x = (X'_x X_x)^{-1} X'_x Y \quad (A-4)$$

This result is not of great value to us unless we can establish a relation between  $\hat{\beta}_x$  and  $\hat{\beta}$ , i.e. if we know  $\hat{\beta}_x$  we can make an inference about  $\hat{\beta}$ .

Substituting (A-1) into (A-4) we have

$$\hat{\beta}_x = (X'_x X_x)^{-1} X'_x (X\beta + u)$$

$$= (X'_x X_x)^{-1} X'_x X\beta$$

$$+ (X'_x X_x)^{-1} X'_x u$$

$$\therefore E(\hat{\beta}_x) = (X'_x X_x)^{-1} X'_x X\beta$$

$$= D\beta \quad (A-5)$$

$$\text{where } D = (X'_x X_x)^{-1} X'_x X \quad (A-6)$$

From (A-5) we can state that  $\hat{\beta}_x$  is an unbiased estimator of  $D\beta$  and, therefore, knowing  $D$  we can use  $\hat{\beta}_x$  as an estimator of  $\beta$ .

Equation (A-6) implies that  $D$  is obtained from the regressions

$$X = X_x D + \text{vector of residuals}$$

where  $X = [X_1 X_2 \dots X_k]$

and  $X_x = [X_1 X_2 \dots X_r]$

with  $r < k$  and hence  $X_{r+1}, X_{r+2}, \dots$  are the variables omitted from the regression.

The matrix  $D$  is of order  $r \times k$ . The  $r$  columns of  $D$  form an identity matrix of order  $r \times r$ , since the first  $r$  columns form  $X_x$ , and therefore

$$D_{r,r} = (X'_x X_x)^{-1} X'_x X_x = I$$

Hence,

$$D = (X'_x X_x)^{-1} X'_x X$$

$$= \begin{bmatrix} 1 & 0 & \dots & 0 & d_{1,r+1} & \dots & d_{1k} \\ 0 & 1 & \dots & 0 & d_{2,r+1} & \dots & d_{2k} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & 1 & d_{r,r+1} & \dots & d_{rk} \end{bmatrix}$$

where the  $d_{ij}$  are elements of the  $D$  matrix.

$$\therefore E(\hat{\beta}_x) = D\beta$$

$$= \begin{bmatrix} 1 & 0 & \dots & 0 & d_{1,r+1} & \dots & d_{1k} \\ 0 & 1 & \dots & 0 & d_{2,r+1} & \dots & d_{2k} \\ \vdots & \vdots & \ddots & \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \dots & 1 & d_{r,r+1} & \dots & d_{rk} \end{bmatrix}$$

$$= \beta_1 + (d_{1,r+1} \beta_{r+1} + \dots + d_{1k} \beta_k)$$

$$+ \dots + d_{1k} \beta_k$$

$$\text{and } E(\hat{\beta}_x) - \beta_1 = d_{1,r+1} \beta_{r+1} + \dots + d_{1k} \beta_k$$

$$+ \dots + d_{1k} \beta_k \quad (A-7)$$

Equation (A-9) defines the relationship between the estimator  $\hat{\beta}_x$  of the incorrect specification and the parameter  $\beta$  of the correct one, whereas equation (A-10) defines the specification bias of the estimator  $\hat{\beta}_x$ .

<sup>1</sup>H. Theil, "Specification Errors and the Estimation of Economic Relationships", Review of the International Statistical Institute, XXV (1957), pp. 41-51.



# ST-SQUARES BIAS AND ONSISTENCY IN ULTANEOUS-EQUATION IMATION

first point to notice in simultaneous-  
tion estimation is that it is very likely to  
n biased and inconsistent estimates of  
parameters of a simultaneous model if  
employ the single-equation least-squares  
ethod of estimation, i.e., if we apply OLS  
e structural equations one by one.  
his is the well-known Haavelmo's propo-  
<sup>1</sup>, which states that if we have a re-  
ship of the form

$$Y_t = f(Y_{2t}, Y_{3t}, X_{1t}, X_{2t} \dots u_{1t}) \quad (B-1)$$

where the  $Y$ 's are endogenous and the  $X$ 's  
are exogenous variables, and if we have other  
relationships in the model then simultaneous  
estimation implies that the disturbance term,  
 $u_t$ , is dependent upon the endogenous vari-  
ables on the right-hand side of equation  
(B-1). To demonstrate this problem consider  
the simplest possible simultaneous model

$$C_t = \alpha + \beta Y_t + u_t \quad (B-2)$$

$$Y_t = C_t + Z_t \quad (B-3)$$

where  $Z_t$  is the only exogenous variable  
in this model and that the random  
disturbance term has the following proper-

$$E(u_t) = 0 \text{ for all } t \quad (B-4)$$

$$E(u_t u_{t+s}) = \begin{cases} 0 & \text{for } s \neq 0 \\ \sigma^2 & \text{for } s = 0 \end{cases} \quad (B-5)$$

Substituting (B-2) into (B-3) and rearranging  
yields

$$Y_t = \frac{\alpha}{1-\beta} + \frac{1}{1-\beta} Z_t + \frac{1}{1-\beta} u_t$$

$$E(Y_t) = \frac{\alpha}{1-\beta} + \frac{1}{1-\beta} Z_t$$

$$Y_t - E(Y_t) = \frac{1}{1-\beta} u_t \quad (B-6)$$

Now we consider the covariance of  $u_t$  and  
 $Y_t$  which is by definition

$$\begin{aligned} \text{Cov}(u_t, Y_t) &= E\{u_t [Y_t - E(Y_t)]\} \\ &= \frac{\sigma^2 u}{1-\beta} \neq 0 \end{aligned} \quad (B-7)$$

From (B-7) we conclude that  $u_t$  and  $Y_t$   
are not independent, because their covariance  
does not vanish.

Next, we prove that due to the dependence  
between  $u_t$  and  $Y_t$  if we apply OLS to

equation (B-2) we will obtain biased and  
inconsistent estimates  $\hat{\alpha}$  and  $\hat{\beta}$  of the true  
parameters  $\alpha$  and  $\beta$  respectively. Let us sum  
(B-2) over all values and divide by the  
sample size to obtain

$$\bar{C} = \alpha + \beta \bar{Y} \quad (B-8)$$

Subtracting (B-8) from (B-2) gives

$$c_t = \beta y_t + u_t \quad (B-9)$$

where  $c_t = C_t - \bar{C}$  and  $y_t = Y_t - \bar{Y}$

Applying OLS to equation (B-9) we obtain  
an estimate  $\hat{\beta}$  of the parameter  $\beta$

$$\hat{\beta} = \frac{\sum y_t c_t}{\sum y_t^2} \quad (B-10)$$

We have shown, however, that there is a  
stochastic connection between  $u_t$  and  $y_t$  in  
(B-9), i.e.,

$$u_t = \gamma y_t + e_t \quad (B-11)$$

where  $E(e_t) = 0$  for all  $t$ .

Substituting (B-11) into (B-9) yields

$$c_t = (\beta + \gamma) y_t + e_t \quad (B-12)$$

If we multiply (B-12) through by  $y_t$  and sum  
over all values we obtain

$$\sum y_t c_t = (\beta + \gamma) \sum y_t^2 + \sum y_t e_t \quad (B-13)$$

Substituting (B-13) into (B-10) we can  
write

$$\hat{\beta} = \beta + \gamma + \frac{\sum y_t e_t}{\sum y_t^2} \quad (B-14)$$

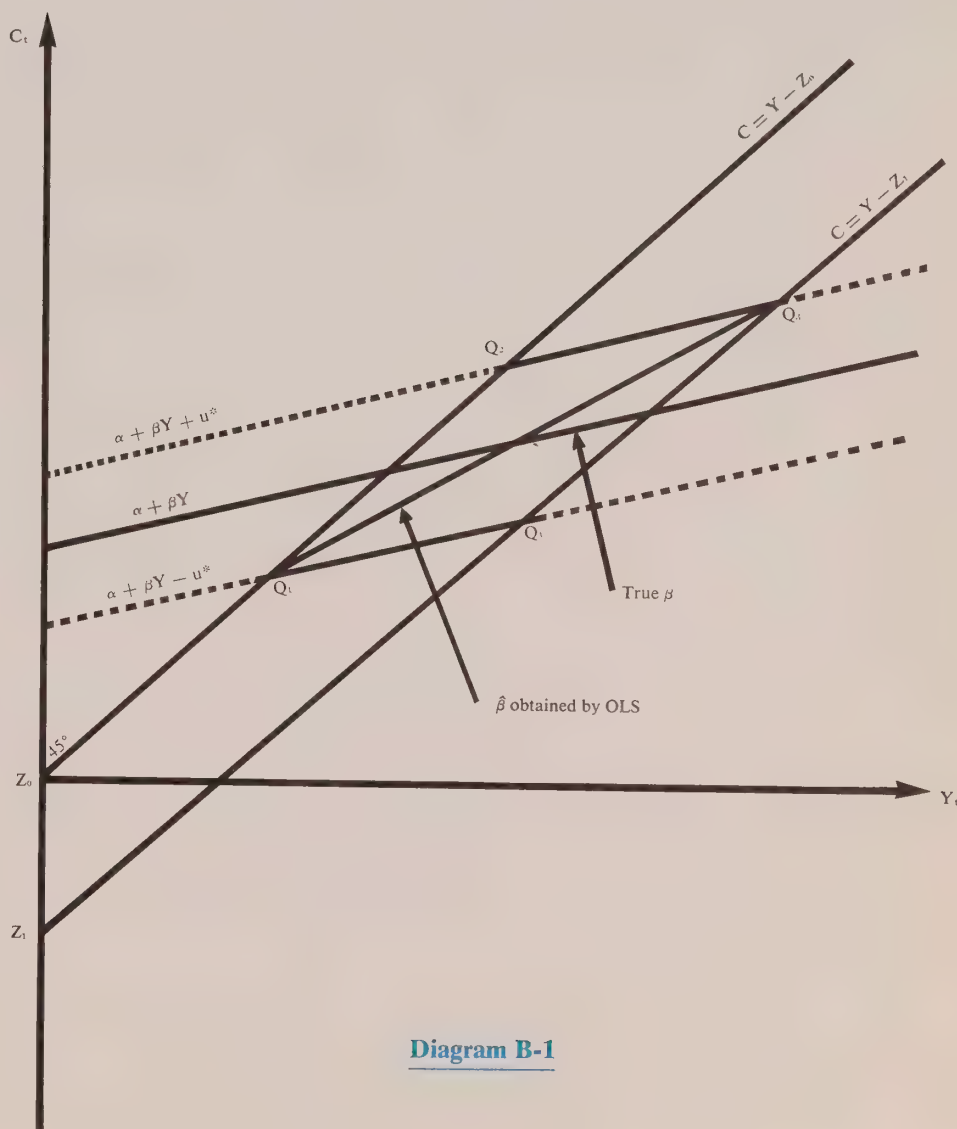


Diagram B-1

Haavelmo, "The Statistical Implications of  
System of Simultaneous Equations",  
Econometrica, II (January 1943).

Taking expected values in (B-14) we obtain

$$E(\hat{\beta}) = \beta + \gamma \quad (\text{B-15})$$

From (B-15) we conclude that  $\hat{\beta}$  is a biased estimator of the parameter  $\beta$ .

Taking probability limits in (B-14) we have

$$\text{Plim}(\hat{\beta}) = \beta + \gamma \quad (\text{B-16})$$

since in the limit  $\sum y_t e_t / \sum y_t^2 = 0$  because  $y_t$  and  $e_t$  are independent.

From (B-16) we conclude that  $\hat{\beta}$  is an inconsistent estimator of the parameter  $\beta$ , that is, the bias does not disappear even if we take infinitely large samples.

An alternative way of demonstrating the bias and inconsistency of OLS estimates in simultaneous-equation models is by using graphical methods as in Diagram B-1. We assume that the disturbance term in the

stochastic equation (B-2) is homoscedastic, that is, it has a constant variance between  $+u^*$  and  $-u^*$ . We also assume two arbitrary values  $Z_0$  and  $Z_1$  for the exogenous variable  $Z_t$  in identity (B-3). The equation lines in the Diagram are, thus, intersected by the identity lines. There are four possible equilibrium points depending on the values assumed by  $Z_t$  and  $u_t$ , as follows:

1. If  $Z_t = Z_0$  and  $u_t = -u^*$   
the equilibrium point is  $Q_1$
2. If  $Z_t = Z_0$  and  $u_t = u^*$   
the equilibrium point is  $Q_2$
3. If  $Z_t = Z_1$  and  $u_t = u^*$   
the equilibrium point is  $Q_3$
4. If  $Z_t = Z_1$  and  $u_t = -u^*$   
the equilibrium point is  $Q_4$

Note that all observations will lie in the parallelogram  $Q_1Q_2Q_3Q_4$ . If we fit a least-squares regression line  $Q_1Q_3$  to the observations, we minimize the sum of squared residuals in the vertical direction and, hence, the least-squares line is tilted counter-clockwise relative to the true line  $\alpha + \beta Y$ , because of the pull of extreme points, which lie near the corners  $Q_1$  and  $Q_3$  of the parallelogram. The least-squares procedure, therefore, will underestimate the slope  $\beta$  and underestimate the intercept  $\alpha$  of the true line.

The conclusion from this analysis is that, in general, the single-equation least-squares method is not appropriate for estimating the parameters of a simultaneous-equation model. This has led to the development of other estimation methods, such as, the two-stage least-squares method, which remove the inconsistency of the estimates.



## TWO-STAGE LEAST-SQUARES METHOD OF ESTIMATION

Appendix B has demonstrated the bias and inconsistency of OLS when applied to simultaneous-equation models. To cope with this problem, Henri Theil<sup>1</sup> has developed the Two-Stage Least-Squares (TSLS) method of estimation which produces consistent and asymptotically unbiased estimates of parameters. The principle of the TSLS is quite simple. Consider the following two-equation system

$$Y_1 = f_1(Y_2, X_1, u_1) \quad (C-1)$$

$$Y_2 = f_2(Y_1, X_2, X_3, u_2) \quad (C-2)$$

where  $Y_i$  represent endogenous variables,  $X_i$  denote exogenous variables and  $u_i$  are random disturbances. Suppose we wish to estimate the parameters of the over-identified equation (C-1). Clearly, we cannot apply the OLS method because the endogenous variable,  $Y_2$  on the right-hand side of (C-1) is correlated with the disturbance term  $u_1$ . In the TSLS method we first obtain the reduced-form of the model

$$Y_1 = F_1(X_1, X_2, X_3, v_1) \quad (C-3)$$

$$Y_2 = F_2(X_1, X_2, X_3, v_2) \quad (C-4)$$

The first stage consists of deriving an estimated series  $\hat{Y}_2$  of  $Y_2$  by applying OLS to equation (C-4). Substituting  $\hat{Y}_2$  into (C-1) we can write

$$Y_1 = f_1(\hat{Y}_2, X_1, u_1) \quad (C-5)$$

In the second stage we apply OLS to (C-5) to obtain consistent estimators since the dependent variable  $\hat{Y}_2$  is a linear function of the  $X_i$  which are by definition independent and, therefore,  $\hat{Y}_2$  is not correlated with  $u_1$ . We now proceed to develop the TSLS method and to prove the consistency of the TSLS estimators.

Consider the first equation of the set  $Y_1 + \Gamma X_t = u_t$ , namely,

$$Y_1 + \Gamma_1 X_t = u_{1t} \quad t = 1 \dots n \quad (C-6)$$

where  $B_1$  is the first row of the B matrix of coefficients attached to endogenous variables

$\Gamma_1$  is the first row of the  $\Gamma$  matrix of coefficients attached to exogenous variables

$Y_t$  is a column vector of  $g$  endogenous variables

$X_t$  is a column vector of  $k$  exogenous variables, and

$u_{1t}$  is a vector of disturbances.

Let the symbols  $\Delta$  and  $x$  denote respectively endogenous included and exogenous included variables or parameters. Then using the *a priori* restrictions on the coefficients of (C-6) we can write this equation as

$$Y_{1t} = \beta_{12}Y_{2t} + \dots + \beta_{1g}\Delta Y_{gt} + \gamma_{11}X_{1t} + \dots + \gamma_{1kx}X_{kxt} + u_{1t} \quad (C-7)$$

Equation (C-7) has been normalized by setting  $\beta_{11} = 1$ . Note that for  $t = 1 \dots n$ , (C-7) is a set of equations which may be written in matrix form as

$$\begin{bmatrix} Y_{11} \\ \vdots \\ Y_{1n} \end{bmatrix} = \begin{bmatrix} Y_{21} \dots Y_{g1} \\ \vdots \\ Y_{2n} \dots Y_{gn} \end{bmatrix} \begin{bmatrix} \beta_{12} \\ \vdots \\ \beta_{1g} \end{bmatrix} + \begin{bmatrix} X_{11} \dots X_{kx1} \\ \vdots \\ X_{1n} \dots X_{kxn} \end{bmatrix} \begin{bmatrix} \gamma_{11} \\ \vdots \\ \gamma_{1kx} \end{bmatrix} + \begin{bmatrix} u_{11} \\ \vdots \\ u_{1n} \end{bmatrix}$$

$$\text{or } Y_1 = Y_2\beta'_2 + X_x\gamma'_{1x} + u_1 \quad (C-8)$$

The procedure of the TSLS method is as follows:

**STAGE I.** Regress each variable in  $Y_2$  on the complete set of all exogenous variables, that is on

$$X = [X_x \ X_{xx}]$$

where  $X_x$  denotes the exogenous variables included in the equation and  $X_{xx}$  denotes the exogenous variables excluded from the equation. This regression implies that we use the following relationship

$$Y_2 = X\beta + e \quad (C-9)$$

where  $e$  represents a vector of least-squares residuals. The regression equation of (C-9) can be written as

$$\hat{Y}_2 = X\hat{\beta} = X(X'X)^{-1}X'Y_2 \quad (C-10)$$

**STAGE II.** Replace  $Y_2$  in (C-8) by its estimate  $\hat{Y}_2$  and regress  $Y_1$  and  $\hat{Y}_2$  and  $X_x$ , that is,

$$Y_1 = \hat{Y}_2\beta'_2 + X_x\gamma'_{1x} + u_1$$

$$= [\hat{Y}_2 \ X_x] \begin{bmatrix} \beta'_2 \\ \gamma'_{1x} \end{bmatrix} + u_1 \quad (C-11)$$

Application of OLS to (C-11) gives the TSLS estimators  $\hat{\beta}'_2$  and  $\hat{\gamma}'_{1x}$

$$\begin{bmatrix} \hat{\beta}'_2 \\ \hat{\gamma}'_{1x} \end{bmatrix} = \left( \begin{bmatrix} \hat{Y}'_2 \\ X'_x \end{bmatrix} \begin{bmatrix} \hat{Y}_2 \\ X_x \end{bmatrix} \right)^{-1} \begin{bmatrix} \hat{Y}'_2 \\ X'_x \end{bmatrix} Y_1 = \begin{bmatrix} \hat{Y}'_2 \hat{Y}_2 & \hat{Y}'_2 X_x \\ X'_x \hat{Y}_2 & X'_x X_x \end{bmatrix}^{-1} \begin{bmatrix} \hat{Y}'_2 Y_1 \\ X'_x Y_1 \end{bmatrix} \quad (C-12)$$

Substituting (C-10) into (C-12) we obtain the final result

$$\begin{bmatrix} \hat{\beta}'_2 \\ \hat{\gamma}'_{1x} \end{bmatrix} = \begin{bmatrix} Y_2 X (X'X)^{-1} X' Y_2 & Y_2 X (X'X)^{-1} X' X_x \\ X'_x X (X'X)^{-1} X' Y_2 & X'_x X_x \end{bmatrix}^{-1} \begin{bmatrix} Y_2 X (X'X)^{-1} X' Y_1 \\ X'_x Y_1 \end{bmatrix} \quad (C-13)$$

Since

$$\begin{aligned} \hat{Y}'_2 \hat{Y}_2 &= [X (X'X)^{-1} X' Y_2]' X (X'X)^{-1} X' Y_2 \\ &= Y'_2 X (X'X)^{-1} X' X (X'X)^{-1} X' Y_2 \\ &= Y'_2 X (X'X)^{-1} X' Y_2 \end{aligned}$$

$$\begin{aligned} \hat{Y}'_2 X_x &= [X (X'X)^{-1} X' Y_2]' X_x \\ &= Y'_2 X (X'X)^{-1} X' X_x \end{aligned}$$

$$\begin{aligned} \hat{Y}'_2 Y_1 &= [X (X'X)^{-1} X' Y_2]' Y_1 \\ &= Y'_2 X (X'X)^{-1} X' Y_1 \end{aligned}$$

$$\begin{aligned} \text{and } X'_x \hat{Y}_2 &= \text{transpose of } \hat{Y}'_2 X_x \\ &= X'_x X (X'X)^{-1} X' Y_2 \end{aligned}$$

The relationship (C-13) gives the TSLS estimators directly without going through the two stages described above.

To establish the consistency of the TSLS estimators, first we prove that the TSLS estimation method is equivalent to the instrumental variables estimation method which gives consistent estimators.

Consider the linear model

$$Y = X\beta + u \quad (C-14)$$

If  $\text{Plim} \left( \frac{1}{n} X'n \right) \neq 0$  then the OLS estimators will be biased and inconsistent. If we have a set of instrumental variables

$$Z = [Z_1, Z_2, \dots, Z_k]$$

and  $\text{Plim} \left( \frac{1}{n} Z'u \right) = 0$  then the instrumental variable estimator,  $b$ , is

$$\begin{aligned} b &= (Z'X)^{-1} Z'Y \\ &= (Z'X)^{-1} Z' X\beta + u \\ &= (Z'X)^{-1} Z' X\beta + (Z'X)^{-1} Z'u \\ &= \beta + (Z'X)^{-1} Z'u \\ &= \beta \text{ since } Z'u = 0 \text{ is the limit.} \end{aligned}$$

Therefore, the instrumental variable estimator,  $b$ , is consistent.

Consider next the matrix equation (C-8). In the second stage of TSLS we use  $\hat{Y}_2$  as an instrument for  $Y_2$ , and  $X_x$  as an instrument for itself, so that



$$Z = [\hat{Y}_2 \ X_x] \text{ and } X = [Y_2 \ X_x]$$

$$\begin{aligned} X &= \begin{bmatrix} \hat{Y}'_2 \\ X'_x \end{bmatrix} [Y_2 \ X_x] \\ &= \begin{bmatrix} \hat{Y}'_2 Y_2 & \hat{Y}'_2 X_x \\ X'_x Y_2 & X'_x X_x \end{bmatrix} \end{aligned} \quad (C-15)$$

$$= (Z'X)^{-1} Z'Y$$

$$= \begin{bmatrix} \hat{Y}'_2 Y_2 & \hat{Y}'_2 X_x \\ X'_x Y_2 & X'_x X_x \end{bmatrix}^{-1} \begin{bmatrix} \hat{Y}'_2 Y_1 \\ X'_x Y_1 \end{bmatrix} \quad (C-16)$$

ains to show that:

the instruments  $\hat{Y}_2$  and  $X_x$  are legitimate, i.e., uncorrelated in probability limit with the  $u_1$

the instrumental variable estimators are identical with the TSLS estimators.

rding the first point we observe that

$$\text{Plim} \left( \frac{1}{n} X'_x u_1 \right) = 0$$

by definition  $X_x$  and  $u_1$  are not corre-

arly,

$$\begin{aligned} \text{Plim} \left( \frac{1}{n} \hat{Y}'_2 u_1 \right) &= \text{Plim} \frac{1}{n} Y'_2 X (X'X)^{-1} X' u_1 \\ &= \text{Plim} \left[ \frac{1}{n} Y'_2 X (X'X)^{-1} \right] \text{Plim} \left( \frac{1}{n} X' u_1 \right) \\ &= 0 \quad \text{since } \text{Plim} \left( \frac{1}{n} X' u_1 \right) = 0 \end{aligned}$$

ding the second point, we compare the estimators in (C-12) with the instrumental variable estimators in (C-16). We ve that all terms are the same with the tion of the elements which form the column in the inverse matrices.

$$\begin{aligned} \hat{Y}'_2 Y_2 &= \hat{Y}'_2 (\hat{Y}_2 + e) \\ &= \hat{Y}'_2 \hat{Y}_2 + \hat{Y}'_2 e \\ &= \hat{Y}'_2 \hat{Y}_2 \end{aligned}$$

e denotes a vector of OLS residuals regression of  $Y_2$  on  $X$  since  $\hat{Y}'_2 e = 0$ , s, the products of predicted values and residuals are identically equal to zero.

arly,

$$\begin{aligned} X'_x Y_2 &= X'_x (\hat{Y}_2 + e) \\ &= X'_x \hat{Y}_2 + X'_x e \\ &= X'_x \hat{Y}_2 \quad \text{since } X'_x e = 0 \end{aligned}$$

Hence, the TSLS estimators are equivalent to instrumental variable estimators, which have been shown to be consistent estimators.













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Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

# Ontario Economic Review

May/June 1971  
Volume 9, Number 3

## The Ontario Economy

### An Analysis of Fertility Trends in Ontario

T. R. Barratt, *Demographer*  
Department of Treasury and Economics

### Selected Economic Indicators

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*Deputy Minister*

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#### About the Review

The feature article for the May-June edition of the *Ontario Economic Review* examines in depth the levels of fertility for the counties and regions of Ontario. Various measures of fertility are developed in order to establish a comprehensive base for the analysis and projection of population growth.

During the period 1961 to 1969 fertility in the province underwent an almost continuous decline of approximately 30 to 35 per cent. The result of this decline may be felt for generations as a reduced number of women reach the reproductive ages 15 to 20 years hence. The smaller child-bearing population will result in a slowdown in the rate of Ontario's population growth. However, recent levels of fertility for the province suggest that the protracted decline during the 1960's may be leveling off.

The article was prepared by T. R. Barratt in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics.

#### Indicator Charts, Pages 16-18

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 16-18 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## ario Budget 1971

April 26 Provincial Treasurer Darcy McKeough introduced the technique of "full employment budgeting" to Canada by adding a new five per cent tax credit to encourage job-creating investment in machinery and equipment. In his first budget statement to the Ontario Parliament Mr. McKeough described the corporation income tax credit as a powerful incentive for business expansion. He also plans to stimulate the economy by a record deficit of \$415 million, and controls on government costs to put more money in the hands of consumers and businesses. The Treasurer warned, however, that the province's moves could not achieve full employment unless the federal government made its efforts, primarily by removing the 10 per cent surtaxes on personal and corporation incomes.

Other budget features include: reduction of interest costs from corporation income tax for Ontario businesses to buy shares in other corporations, to encourage Canadian ownership and offset the present U.S. advantage in taking over Canadian companies;

further large cuts in succession duties, with exemptions for widows and widowers reduced from \$125,000 to \$250,000, duty on estates increased from \$50,000 to \$100,000, and surtaxes eliminated for preferred beneficiaries such as children and grandchildren. These moves will greatly assist in the continuation of family businesses and farms;

equalization of beer prices between northern and southern Ontario, involving a 11-cent reduction in the north and a 10-cent increase in the south on 24-bottle cases. This still leaves Ontario's beer prices the lowest in Canada;

elimination of fishing licence fees for Ontario residents.

McKeough also announced that, beginning April 1st, 1972, Ontario would insure nursing home and home care services under a health insurance program. In the current budget year, the Province will spend an additional \$20 million to expand staff and services for mentally retarded children.

To intensify its environment programs, the government will increase investment by \$32 million to a total of \$78 million for land acquisition for future public use and for increased spending on pollution control facilities.

The Treasurer severely criticized Ottawa's restraint policies which he estimated have cost Ontario about \$2 billion in potential growth of gross provincial product and created the highest unemployment total in Ontario in a decade. About 200,000 Ontario people are out of work according to recent DBS reports.

The projected \$415 million deficit arising from total outlays of \$4,262 million and anticipated revenues of \$3,847 million is an increase of \$300 million over last year and is scheduled to finance a variety of measures to stimulate the Ontario economy.

These include:

- \$78 million in increased property tax relief to give Ontarians more spending income, and continue the provincial-municipal tax-reform program;
- \$45 million in increased subsidies and lending programs to encourage house construction and associated employment;
- \$18 million in summer jobs for young people. This program will provide employment for 14,000 students in the various government departments and agencies during the coming summer.

Commenting on the program of expanded relief to local taxpayers, Mr. McKeough stated that the Ontario Government is "unequivocally committed to the long-run goal of increasing financial support to local governments in order to reduce the burden of financing that falls upon the property tax". The \$78 million allocated to new reform measures this year, along with a \$31 million increase in previous reforms brings the total value of Ontario's program to reduce the property tax burden to \$461 million in 1971-72.

Since 1968, the local effective tax rates have risen by only three per cent annually, compared to an average of 5.4 per cent in the period from 1960 to 1967. In 1971, the Province's support for local school costs will increase to 55 per cent, a large step toward the commitment of 60 per cent subsidization in 1972-73. Accordingly, no increase in education taxes is anticipated and only a moderate increase in municipal taxes is forecast. Mr. McKeough, who formerly served as minister of municipal affairs, promised additional tax reform measures for 1972, including consolidation and simplification of municipal grants, increased unconditional grants, and an acceleration in provincial payments to local governments.

The five per cent tax credit for investment in machinery and equipment is expected to cost \$250 million in reduced corporation income tax between 1971-73 and reflects the Government's concern over the lagging economy. DBS recently reported that machinery and equipment investment in Ontario is expected to increase only three per cent in 1971, down from 13 per cent in 1970 and 18 per cent in 1969. Moreover, manufacturing investment as a whole in Ontario is predicted to decline from \$1,173 million in 1970 to \$1,137 million in 1971.

The Ontario credit will be given for machinery and equipment purchased after budget day and put in place and used in Ontario before March 31, 1973. Companies unable to take advantage of the credit during this 23 month period will be able to carry it forward for one additional year, to April 1, 1974. The tax credit will assist in the modernization of capital stock to increase the long-run productivity of Ontario industry, and help achieve other social and economic objectives, particularly increased investment in pollution abatement equipment.

The five per cent tax credit is one of two tax incentives provided in the Ontario Budget. The second incentive permits Ontario corporations to deduct interest on money borrowed to purchase shares in other corporations.

This deduction will reduce the tax disadvantage for Ontario companies in bidding against American firms to take over other companies. Until now, American firms have enjoyed a distinct advantage because U.S. laws allow such an interest deduction to their companies. Mr. McKeough urged the federal government to make a similar move in its corporation income tax so that all companies in Canada can compete on equal terms with foreign companies.

Mr. McKeough also served notice that Ontario would protect its people against Ottawa's centralization policies and its deliberate efforts to curtail the Ontario economy.

The major priority of the Ontario budget, according to the Treasurer, was to reduce unemployment and restore economic strength. But he warned Ontario could not hope to do it alone.

"It is critical," he said, "that our actions be reinforced by the full use of the major fiscal and monetary policy instruments at the disposal of the Government of Canada."



# An Analysis of Fertility Trends in Ontario

T. R. Barratt, *Demographer*

Department of Treasury and Economics

## I — PURPOSE OF STUDY

The purpose of this study is to examine in depth the levels of fertility<sup>1</sup> for the counties<sup>2</sup>, regions and sub-regions of Ontario, with a view to providing various measures of fertility in order to establish a comprehensive base from which to analyse and project population growth. A presentation of recent and historical provincial measures of fertility is also given.

Statistics shown were, in the main, calculated by the Economic Analysis Branch, Department of Treasury and Economics, and are based on Census of Canada Reports and Ontario Vital Statistics reports. Some material, primarily at the provincial level, was taken directly from these sources, as well as from DBS Vital Statistics publications.

It should be pointed out that statistics shown for other than census years are based on population estimates and not actual counts.

## II — MEASURES TO BE USED

Six measures of fertility have been used in this study:

1. Crude Birth Rate
2. General Fertility Rate
3. Age Specific Birth Rates
4. Total Fertility Rate
5. Gross Reproduction Rate
6. Child/Woman Ratio

In addition to the above: a fertility index based on the provincial rate for the given year has been calculated for the county, region and sub-region rates for the years 1961-1969; and the 54 counties (and districts) have been ranked according to each separate fertility rate (except age specific).

### Crude Birth Rate

The crude birth rate is the most commonly quoted measure of fertility, and one of the easiest to calculate. It is merely the number of births in a population during a given year divided by that population (and usually multiplied by 1000). Accordingly, if a crude rate is 25 it means that there were 25 births for every 1000 people in the population. While crude birth rates are good indications of how fast a population is adding to itself by births, they are sometimes misleading when used as a basis for drawing conclusions about the actual level of fertility (in light of the poten-

tials for fertility). The crude rate can be affected as much by changes in the age and sex distribution of the population as by changes in fertility patterns. Similarly it can be misleading to compare the crude rates of different populations since differences may be due merely to differences in the sex and age structure of the populations.

In addition, large numbers of persons often migrate, forming unique groups which have withdrawn from one population and been introduced into another. Since migrants are predominantly young adults, their movements tend to decrease the crude rate in the place of origin and increase the rate in the destination.

### General Fertility Rate

Because the crude rate is computed on the basis of the total population it is possible to improve upon it by adopting a more accurate base. In computing birth rates, it should be remembered that only women bear children and therefore men should be dropped from the denominator of the crude calculation. Furthermore, only females between certain ages bear children. The childbearing age for females is generally considered to be 15-49.<sup>3</sup>

The crude rate ( $\frac{\text{births per year} \times 1000}{\text{total population}}$ ) then

becomes the general fertility rate

$$\left( \frac{\text{births per year} \times 1000}{\text{females 15-49}} \right).$$

A general fertility rate of 105 means that there were 105 births during the year for every 1000 females in the age group 15-49.

The general fertility rate is a more accurate measure of fertility than the crude birth rate since it is not affected by differences in sex ratios, and is less affected by differences in age structure.

Table I — Selected County Rates, 1966

County	Crude Birth Rate	General Fertility Rate
Prince Edward	18.1	86.8
Stormont	18.1	80.2
Welland	18.1	76.5

From Table I it can be seen that the three counties, Prince Edward, Stormont and Welland had identical crude birth rates in 1966. However, when the general fertility rates are compared it is apparent that wide differences exist.

The effects of removing extraneous elements from the crude rate can be observed in Table II.

Removing males from the denominator results in a spread of 0.6 among the rates, Prince Edward being the highest and Stormont the lowest. When females 0-14 are also removed a spread of 1.2 resulted, Stormont now being the highest and Welland the lowest. When the final extraneous element (females 50+) was removed a spread of 10.3 resulted among the rates with Prince Edward now being the highest and Welland the lowest.

It appears, therefore, that when both crude birth rate and the general fertility rate are available, the general rate can be taken as a more accurate single number measure of fertility.

### Age Specific Rates

Although the general fertility rate is an improvement over the crude rate, it too can be affected by age distribution (in this case by the age distribution of females aged 15-49) since fertility is not evenly distributed a

Table II — Selected County Rates (with adjustments), 1966

County	Crude Birth Rate	Males Removed	Males and Females 0-14 Removed	Males, Females 0-14 and Females 50+ Removed
Prince Edward	18.1	36.4	53.2	86.8
Stormont	18.1	35.8	54.0	80.2
Welland	18.1	36.3	52.8	76.5

<sup>1</sup>In this study fertility refers to the rates at which children are born; fecundity is the term which refers to the ability to bear children.

<sup>2</sup>Northern Ontario, and part of Central Ontario are divided into districts, not counties. However,

for the statistics used and conclusions shown in this paper, no distinction has been made between the two entities. The term "counties of Ontario" will refer to both the counties and the districts of Ontario. When referred to

individually, however, districts will be designated as such.

<sup>3</sup>Females aged 15-44 are sometimes used instead of females 15-49.



### Table III – Selected Fertility Measures, 1966

County	General Fertility Rate	Age Specific Rates						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
Carleton	72.9	39.6	147.2	153.0	102.6	54.3	14.6	1.0
Hastings	72.9	51.5	168.6	152.6	90.4	52.8	14.9	1.1

segment of female ages. For this reason the general fertility rate is not adequate for a detailed examination of fertility patterns.

When detailed examinations of fertility are desired, age specific rates are preferable. Age specific rates measure the level of fertility at single years of age between 15 and 49. Because these rates would entail 35 separate rates of fertility (one for each year of age), the rates are usually combined into five-year age groups. This results in seven measures of fertility for a given population.

Age specific rates are calculated by dividing the births to the women in a given age group, by the number of women in that age group (and usually multiplying by 1000), i.e. rate for ages 15-19 =

$$\frac{\text{Births to females aged 15-19}}{\text{No. of females aged 15-19}} \times 1000.$$

From Table III it can be observed that although Carleton and Hastings counties have the same general fertility rates, the patterns of fertility are somewhat different. Hastings county has higher rates of fertility in the younger age groups while in the intermediate age groups Carleton's rates are higher. It is essential, if accurate analysis of fertility trends are to be made, that the effects of age distribution on the rates studied, be eliminated. The age specific rates succeed in eliminating most age distribution effects.

### Table IV – Hypothetical County Rates

County	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total	Total	Gen.
									Fert.	Fert.
									Rate	Rate
Females	1000	1000	1000	1000	1000	1000	1000	7000		
Births	50	200	150	100	50	15	5	570		
Rate	50	200	150	100	50	15	5		2850 <sup>1</sup>	81.4
Females	800	800	900	900	1200	1200	1200	7000		
Births	40	160	135	90	60	18	6	509		
Rate	50	200	150	100	50	15	5		2850 <sup>1</sup>	72.7

<sup>1</sup>Because the age specific rates are based on five-year age groups, the sum of the rates is multiplied by five to give the total fertility rate.

even though the rates of birth in each age group are identical. As would seem appropriate from the above example, the total fertility rate is generally considered to be the most accurate single number indicator of pure fertility. The general fertility rate, on the other hand, is useful as an indicator of the net interaction between fertility and the age distribution of a given population of women in the child-bearing years.

### Gross Reproduction Rate

The gross reproduction rate is defined as "female births per woman (or per 1000 women). The gross reproduction rate =

$$\frac{\text{total fertility rate} \times \text{female births}}{\text{total births}}.$$

This rate is actually a measure of replacement. That is, it measures how many female children a given group of women bear during a given year. The rate tends to be a little less than half of the total fertility rate, since female births usually represent just less than 50 per cent of all births. A gross reproduction rate of one (or 1000)<sup>4</sup> means that women are bearing exactly enough daughters to replace themselves (if mortality is disregarded). In 1966 county gross reproduction rates ranged from a high of 2392 in Manitoulin to a low of 1171 in Muskoka. The gross reproduction rate is merely a total fertility rate for female children.

### Child-Woman Ratio

The child-woman ratio is an indirect measure of the incidence of childbearing in a population of adult women. Specifically, it is the ratio of the number of children under five years of age to the number of women of childbearing age (15-49). The child-woman ratio is usually used where there is no adequate registration of births. The ratio does not directly refer to the number of births, but rather to the census population aged 0-4. If enumerated correctly, these children are the survivors of births during the prior five-year period. The ratio, therefore, is not a precise index of fertility since it is derived from a group of survivors rather than from the number of actual births. The index unavoidably includes the effect of infant and childhood mortality. Furthermore, the age group 0-4 is one of the least reliable portions of the enumerated population. Therefore, absolute values of this ratio do not have great significance. The ratio is at best a relative index of

<sup>4</sup>In this study the gross reproduction rates are "per 1000".

fertility for sections of a homogeneous population. It should be remembered further that this is a five-year index. That is, it measures the average fertility over the past five years. Therefore, large changes in fertility over a one-year period will have a significantly decreased effect on the ratio. These disadvantages of the child-woman ratio make it less desirable as a measure of fertility.

### Additional Measures

#### a) Indexes

An index has been calculated for the following county, region and sub-region rates for the years 1961-1969<sup>5</sup>:

- (i) Crude birth rates
- (ii) General fertility rates
- (iii) Total fertility rates
- (iv) Gross reproduction rates
- (v) Child-woman ratios

The index is based on the Ontario provincial rate for the given year. The Ontario ratio will equal 100. Therefore:

$$\text{index} = \frac{\text{county rate}}{\text{provincial rate}} \times 100.$$

(because the ratio is multiplied by 100, the index can be used as a percentage of the Ontario rate)

The index allows a careful examination of how each county rate compares with the provincial rate for each year of the observation period. Furthermore, it will make county rates more readily comparable among themselves, since they will all have a common base. From Table V, for example, it can be seen that Peterborough County has a general fertility rate about seven per cent lower than the provincial rate, while Prince Edward County has a rate approximately eight per cent above the provincial rate. Furthermore, the total fertility rate for Peterborough is less than two per cent below the provincial rate while the Prince Edward rate is almost 13

Table VI — Fertility Rate Rankings — Kenora 1961 to 1964

Year	Crude Rate	General Fertility Rate	Total Fertility Rate	Gross Reproduction Rate	Child-Woman Ratio
1961	1	1	2	2	3
1962	1	1	1	1	3
1963	1	1	3	2	2
1964	1	1	1	4	2

Table VII — Crude Birth Rates and Total Fertility Rates, Ontario, Selected Years 1921-1969

Year	Crude Birth Rate	Per Cent Change	Total Fert. Rate	Per Cent Change
1921	25.3		3221	
1926	21.4	— 15.4	2727	—
1931	20.2	— 5.6	2648	—
1936	17.3	— 14.4	2217	—
1941	19.1	+ 10.4	2402	+
1946	23.8	+ 24.6	2968	+
1951	25.0	+ 5.0	3223	+
1956	26.6	+ 6.4	3657	+
1961	25.3	— 4.9	3742	+
1966	19.0	— 24.9	2790	—
1969	17.5	— 7.9	2411	—

per cent above the province's rate. Thus, not only a clearer picture is given concerning the relative fertility of the two counties, but an indication of the relationship between the general fertility rate and the total fertility rate can be observed. It should be remembered, however, that while the indexes are excellent indicators of relative fertility levels, they are not mathematically pure, since in their calculation, the numerator (county rates) and the denominator (Ontario rates) are not

mutually exclusive. For this reason, should be taken in the use of these indexes.

#### b) Ranks

Each of the 54 counties (and districts) has been ranked according to each separate measure of fertility (except age specific) for each year. The ranks are listed in ascending order with the highest ranked first and the lowest ranked 54th.<sup>5</sup>

Table VI gives an example of the ranks for Kenora from 1961 to 1964. It can be seen that in 1961 Kenora had the highest crude birth rate and general fertility rate, the second highest total fertility rate and gross reproduction rate, and the third highest child-woman ratio. In 1964, Kenora still ranked first in crude and general fertility rate, moved to first in the total fertility rate, slipped to fourth in the gross reproduction rate, and was second in child-woman ratio. The rankings give a good indication of how an individual county compares with the other counties in year-to-year changes in fertility.

Table V — Selected County Indexes<sup>1</sup>, 1966

County	General Fert. Rate	Index	Total Fert. Rate	Index
Peterborough	93.2	(74.8) <sup>2</sup>	98.4	(2746) <sup>2</sup>
Prince Edward	108.1	(86.8)	113.6	(3170)

<sup>1</sup>Provincial index = 100

<sup>2</sup>Actual rates

<sup>5</sup>Complete tables available by request only



## HISTORICAL FERTILITY TRENDS

A historical review of the patterns of fertility for the Province of Ontario over the last 40-50 years reveals significant fluctuations.

Table VII indicates the levels of fertility in selected years from 1921. Fertility continued to decline during the 1920's and 1930's, increased during the 1940's and 1950's and began to decline again in the 1960's, with current levels being approximately equal to those of the late 1930's and early 1940's. The crude birth rate, which indicates population growth by births, moved from 25.3 births per 1000 population in 1921 to 17.3 in 1936. Shortly thereafter it began to climb, reaching 26.6 in 1956. During the 1960's the rate turned downward reaching an estimated<sup>6</sup> rate of 17.5 per 1000 in 1969.

The total fertility rate, which is considered to be the best single number estimate of fertility, declined from a level of 3221 in 1921 to 2229 in 1936, then climbed to 3742 in 1951 before it again declined to an estimated 3110 in 1969. The total fertility rate in quality indicates the total number of children that 1000 females would have during their child-bearing years at the existing level of fertility. That is, a total fertility rate of 3000 indicates that 1000 women would have 3000 children during their lives, or 3.2 children per woman. Similarly a rate of 2400 indicates an average of 2.4 children per woman during the reproductive cycle.

### The Depression

During the depression fertility patterns in Ontario underwent a substantial change.

Table VIII indicates the patterns of fertility change during the depression. From 1930 to 1937 the crude rate dropped from 20.5 to 16.9, a drop of almost 20 per cent, while the total fertility rate dropped from 2665 in 1930 to 2160 in 1937, a decrease of 19 per cent. After 1937 the rates began to climb, with the crude rate reaching 18.3 in 1940 and the total fertility rate 2313.

It is generally conceded that the main causes of the fertility decline in the 1930's were economic. People, finding their incomes greatly reduced during this period, were reluctant to take on the responsibility of additional family members. Furthermore, the search for employment frequently separated husbands from their families. In addition,

single people were less willing to marry during the depression.

**Table VIII — Crude Birth Rates and Total Fertility Rates, Ontario, 1929-1941**

Year	Crude Birth Rate	Total Fertility Rate
1929	20.5	2665
1930	21.0	2747
1931	20.2	2648
1932	19.2	2529
1933	18.1	2368
1934	17.6	2284
1935	17.6	2274
1936	17.3	2217
1937	16.9	2160
1938	17.9	2272
1939	17.3	2201
1940	18.3	2313
1941	19.1	2402

Table IX indicates that the marriage rate per 1000 population fell significantly in the early years of the depression, levelled off during the middle years, then rose again in the waning years. There is little doubt that the decrease in the marriage rate contributed significantly to the decline in fertility during the 1930's.

**Table IX — Marriage Rates per 1000 Population, Ontario, 1929-1940**

Year	Rate	Year	Rate
1929	8.3	1935	7.5
1930	7.6	1936	7.7
1931	6.9	1937	8.2
1932	6.4	1938	8.1
1933	6.4	1939	9.3
1934	7.3	1940	11.0

### Post-War Baby Boom

After remaining relatively stable during the war, fertility began to increase rapidly in 1946 and remained at relatively high levels for approximately 15 years. This period of high fertility is known as the "Post-War Baby Boom".

The initial increase in fertility in 1946 and 1947 was likely due to young men returning from war duties and beginning or continuing their families. The higher rates of fertility

**Table X — Crude Birth Rates and Total Fertility Rates, Ontario, 1944-1962**

Year	Crude Birth Rate	Total Fertility Rate
1944	19.7	2472
1945	19.7	2468
1946	23.8	2968
1947	26.1	3276
1948	24.4	3095
1949	24.3	3109
1950	24.3	3110
1951	25.0	3222
1952	25.9	3386
1953	26.3	3483
1954	26.6	3586
1955	26.5	3612
1956	26.6	3657
1957	26.8	3714
1958	26.2	3680
1959	26.3	3773
1960	26.1	3793
1961	25.3	3742
1962	24.6	3689

continued through the 1950's. This continuation was essentially due to continued high marriage rates and a trend toward marrying at younger ages.

With wartime employment, and postwar demands for consumer goods, economic prosperity returned after a long depression. Such innovations as unemployment insurance, subsidization of agricultural production and government responsibility for full employment removed one of the primary reasons for deferment of marriage — the economic.

As the marriage rate began to drop in the middle and late 1950's, the percentage of brides under 25 years of age increased sharply. This trend helped to sustain the relatively high post-war levels of fertility by increasing the numbers of females exposed to legitimate pregnancy in the younger age groups.

The above two factors were not entirely responsible for the continuing high fertility rates during this period. Another factor was that more children were being born per married woman than for many decades in the past. Without accurate data on married female births by single years of age, it is difficult to determine the degree to which each factor contributed to the increased level

*Figures for non-census years, while usually reasonably accurate, are based on estimated population figures.*

**Table XI – Marriage Rates and Percentage of Brides Under 25 Years of Age, Ontario, 1944-1962**

Year	Marriages Per 1000 Population	Per Cent of Brides under 25
1944	7.9	65.9
1945	8.5	65.8
1946	11.2	67.4
1947	10.5	66.7
1948	10.1	65.7
1949	9.9	65.8
1950	9.7	66.8
1951	9.8	67.8
1952	9.5	67.3
1953	9.4	67.9
1954	8.8	68.6
1955	8.5	68.5
1956	8.6	69.7
1957	8.3	70.8
1958	8.1	71.1
1959	7.8	72.0
1960	7.5	73.0
1961	7.1	73.3
1962	7.0	74.5

of fertility. It is clear, however, that the interaction of these three factors resulted in substantially increased levels of fertility during the period 1946-1962.

#### IV – ONTARIO FERTILITY 1961-1969

During the period 1961 to 1969 fertility in Ontario underwent an almost continuous decline of approximately 30 - 35 per cent. There are three main reasons for the decline in fertility during the 1960's. These primary causes can be identified as a decline in the marriage rate, a change in the number of children desired by certain sections of the population, and the knowledge and availability of new and more reliable methods of family planning.

The marriage rate, which declined during the middle and late 1950's, remained at a low level for most of the 1960's, averaging 7.7 marriages per 1000 population, an average rate comparable to the 1930's. Lower rates of marriage mean that a smaller proportion of the population is exposed to legitimate pregnancy, especially in the age groups 16 - 29<sup>7</sup>, which results therefore in lower levels of fertility.

<sup>7</sup>15 year olds are not included since very few marriages occur at this age.

**Table XII – Crude Birth Rates and Total Fertility Rates, Ontario, 1961-1969**

Year	Crude Birth Rate	Per Cent Change	Total Fert. Rate	Per Cent Change
1961	25.3	—	3742	—
1962	24.6	— 2.8	3689	— 1.4
1963	23.9	— 2.8	3618	— 1.9
1964	23.0	— 3.8	3475	— 4.0
1965	20.9	— 9.1	3125	—10.1
1966	19.0	— 9.1	2790	—10.7
1967	17.8	— 6.3	2567	— 8.0
1968	17.3	— 2.8	2434	— 5.2
1969	17.5	+ 1.2	2411	— .9
Per Cent Change 1961-1969		—30.8		—35.6

**Table XIII – Marriage Rates, Ontario, 1931-1969**

Year	Marriages Per 1000 Population
1931-1940 (average)	7.9
1941-1950 (average)	10.0
1951-1960 (average)	8.6
1961	7.1
1962	7.0
1963	7.0
1964	7.3
1965	7.6
1966	7.8
1967	8.2
1968	8.5
1969	9.0 <sup>1</sup>
1961-1969 (average)	7.7

<sup>1</sup>preliminary data.

**Table XIV – Marriage Rates, Ontario, 1956-1966**

Year	Marriages Per 1000 Pop.	Per Cent Change 1956-66	Total Marriage Rate – Brides Aged 16-19	Per Cent Change 1956-66	Per Cent of Females Aged			Average Per Cent Age Group Change (1956-66)
					16-19	20-24	25-29	
1956	8.6		1072		5.8	6.8	7.7	
1966	7.8	—9.3	915	—14.6	7.8	7.0	6.2	19



One of the most important developments during this period was the introduction of the oral contraceptive or birth control pill. The "pill" is considered to be one of the best and most effective methods of birth control. A recent Canadian study<sup>8</sup> indicated that in November, 1967, 28.9 per cent of married females under the age of 46 were using oral contraceptives and another 21.1 per cent planned to use them. Among the women not using orals, 31.1 per cent were using other means, 19.9 per cent were using the rhythm method and 20.1 per cent were pregnant. Among the sterile. Among those not using oral contraceptives, 35 per cent cited the possible health hazard as the reason while another 15 per cent cited unpleasant side effects. Only 10.4 per cent cited religious objections. This study was done for Canada, however, it is possible that Ontario statistics would show an even higher usage rate for oral contraceptives.

#### Specific Rates

Age-specific birth rates give the clearest picture of fertility trends from 1961-1969. The rate for females 15-19 dropped from 69.5 per 1000 to 49.2 during this period — a drop of 29.2 per cent. Although a significant reduction, this was the smallest of the age-specific rate decreases. A large number of pregnancies in this age group are accidental pregnancies, reflecting the performance of persons unaccustomed to practising birth control. During the period 1961-1968, for instance, the legitimate fertility rate for the 15-19 age group fell 33 per cent while the

illegitimate rate actually rose 18 per cent. Illegitimate births accounted for 28 per cent of all births from this age group in 1968.

The age specific rate for females 20-24 fell 36.5 per cent between 1961 and 1969, from 239.8 births per 1000 to 152.2. The reduction in the marriage rate affects this age group more than others, and no doubt played a significant role in the decline of this birth rate during the period. Furthermore, it is in the age group 20-24 that couples are most likely to defer pregnancy. In addition, the tendency toward spacing lessens the chances of having more than one child during this period. Illegitimate births accounted for only eight per cent of all births in this age bracket.

Table XV shows twelve separate rates of fertility for Ontario; seven age specific rates, the crude birth rate, the general fertility rate, the total fertility rate, the gross reproduction rate and the child-woman ratio, for the years 1961 through 1969.

The age group 25-29 reflected a decline from 211.6 in 1961 to 148.4 in 1969 — a drop of 29.9 per cent. This age group too is affected by the lowering of the marriage rate. In addition, some families have already decided to have no more children by the time they reach this age. It is likely that the drop in fertility was not as great as for the 20-24 age group because pregnancies deferred from that group were likely to occur in this age category.

The remaining age groups all experienced declines in fertility from 35.7 per cent to 51.1 per cent. These declines likely resulted from the combination of better family plan-

ning techniques and a commitment to limit family size among a significant portion of persons of these ages.

#### Crude Birth Rate

The crude birth rate for Ontario measured 25.3 in 1961, dropped to 17.3 by 1968 and then rose slightly to 17.5 in 1969. The biggest declines in the crude rate occurred in 1965 and 1966. It is difficult to explain precisely the apparent rise in the rate in 1969, although it is probably a combination of a slowing in the rate of fertility decline and an increase in the proportion of females in the early childbearing ages.

#### General Fertility Rate

The general fertility rate followed the pattern of the crude rate almost exactly. From a high of 108.3 births per 1000 women 15-49 in 1961, it moved to a low of 71.9 in 1968, only to rise slightly to 72.0 in 1969. It is likely that the rise in the rate in 1969 was for the same reasons as the rise in the crude rate.

#### Total Fertility Rate

The total fertility rate for the province declined each year during the period 1961-1969. From a high of 3742 in 1961, the rate had reached 2411 by 1969, a decline of 35.6 per cent. The rate declined most quickly in 1965 and 1966, dropping from 3475 to 2790 during these two years. If the rate were to remain at the 1969 level, each female would average approximately 2.4 children as she passed through the childbearing cycle (disregarding mortality).

Table XV — Ontario Birth Rates, 1961-1969

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Crude Birth Rate	General Fert. Rate	Total Fert. Rate	Gross Reprod. Rate	Child/Woman Ratio
1961	69.5	239.8	211.6	134.2	69.8	21.9	1.6	25.3	108.3	3742	1824	.508
1962	64.5	239.9	210.5	133.9	65.6	21.9	1.4	24.6	105.6	3689	1796	.511
1963	60.3	233.7	208.1	133.1	66.2	21.1	1.2	23.9	102.9	3618	1759	.508
1964	57.8	219.7	202.4	128.6	64.6	20.4	1.6	23.0	98.6	3475	1686	.499
1965	58.3	192.9	180.6	114.5	59.3	17.8	1.5	20.9	89.0	3125	1521	.486
1966	57.4	171.3	160.2	98.8	52.8	16.2	1.3	19.0	80.3	2790	1361	.467
1967	53.4	162.0	149.2	88.6	45.9	13.4	1.0	17.8	74.8	2567	1247	.427
1968	50.1	155.1	145.0	83.0	41.1	11.5	1.0	17.3	71.7	2434	1184	.398
1969	49.2	152.2	148.4	82.3	38.3	10.7	.8	17.5	72.0	2411	1174	.373
Change 1961-1969	-29.2	-36.5	-29.9	-38.7	-45.1	-51.1	-50.0	-30.8	-33.5	-35.6	-35.6	-26.6

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Gross Reproduction Rate

The gross reproduction rate is similar to the total fertility rate except it is only calculated for female births. Since, for a population the size of Ontario, the ratio of female births to total births remains relatively constant at .485 to .488, the gross reproduction rate follows almost exactly the trends of the total fertility rate. The gross reproduction rate declined from 1824 in 1961 to 1174 in 1969, a drop of 35.6 per cent, the same as the total fertility rate. If the gross reproduction rate remains at the 1969 level, each woman will average approximately 1.2 female children during the reproductive cycle<sup>9</sup>.

Child-Woman Ratio

The child-woman ratio declined from .508 in 1961 to .373 in 1969, a drop of 26.6 per cent. Because of the structure of this ratio it is not as reliable as others in judging yearly changes. Nevertheless the child-woman ratio does indicate overall trends in fertility since it acts as a type of five-year moving average. For this reason also, the ratio tends to lag two or three years behind actual changes in fertility.

Summary

In summary, Ontario experienced a continued decline in fertility between 1961 and 1969. The decline averaged 30-35 per cent. The result of this decline may be felt for generations as reduced cohorts of child-bearers reach the reproductive ages 15-20 years hence. This smaller childbearing population will result in a slowdown in the speed at which Ontario would normally be expected to add to itself by births. This point will be expanded in Chapter VI.

V – COUNTY FERTILITY

All Ontario counties and districts experienced a general decline in fertility during the 1960's. Some counties, such as Stormont and Bruce, showed continually declining rates of fertility for each year during the period 1961-1969. For other counties such as Perth, the decline did not begin until 1963, whereas in Huron County and the District of Parry Sound, the decline lasted only until 1968, with increases in fertility being shown for 1969.

1961

In 1961 the crude birth rates for the 54 counties and districts of Ontario ranged from

a high of 33.5 births per 1000 population in the District of Kenora to a low of 18.7 in Grey County. Kenora's crude birth rate was 32.4 per cent above the provincial level of 25.3, while Grey's rate was 26.1 per cent below the provincial figure. In all there were 31 counties above the provincial level and 21 counties below it. Carleton and Middlesex counties each had rates of 25.3, equal to the provincial rate. York County, the largest in Ontario, made up 27.8 per cent of the total provincial population in 1961. York, therefore, has the largest influences on the provincial rates. In 1961 York had a crude rate of 24.9 births per 1000 population. This rate had an index of 98.4 and ranked 24th among the counties and districts.

The general fertility rate ranged from 154 births per 1000 females aged 15-49 in Kenora to 92.2 births per 1000 in Grey. Kenora's rate was 42.2 per cent above the provincial level while Grey's was 14.9 per cent below it. York County had a general fertility rate of 98.9. The index was 91.3 and York ranked 49th among the counties and districts for this rate. There were 29 counties with rates above the provincial level of 108.3 and 25 counties below this figure.

As outlined in Chapter II the sum of the age specific birth rates, or "Total Fertility Rate" is considered to be the best single number estimate of the fertility of a population. A careful examination of individual age specific rates is necessary however, if a detailed knowledge of changing fertility patterns within a homogeneous population is desired. Although presentation of these rates is beyond the scope of this review, detailed tables showing five-year age specific rates for each calendar year 1961-1969 are available upon request from the Demographic Studies Section, Economic Analysis Branch, Department of Treasury and Economics, Frost Bldg., Queen's Park, Toronto 182. Readers

are urged to make a careful examination of these tables, should knowledge concerning detailed fertility patterns be required.

Total fertility rates for 1961 ranged from 5191 in the District of Manitoulin to 3324 in York County. Manitoulin's rate had an index of 138.7 while York's index was 88.8, compared with the provincial total fertility rate of 3742. It is interesting to note that Manitoulin ranked 11th in crude birth rate and York 24th, while in total fertility rate Manitoulin ranked first and York 54th. This indicates the caution which must be used when comparing fertility levels by means of the crude rate alone. In 1961 there were 38 counties and districts whose total fertility rate was higher than the provincial level and 14 whose rates were lower.

The gross reproduction rates, which are usually just less than one-half of the total fertility rates, ranged from Manitoulin's high of 2596 to a low of 1589 in Grey County. York had a rate of 1615 and was ranked 53rd among the counties and districts. In 1961 38 counties were higher than the provincial rate of 1824, and 16 were lower.

The child-woman ratio, which is the ratio of children aged 0-4 to females aged 15-49, ranged from a high of .682 in Russell County to a low of .437 in York. The provincial rate was .508, with 37 counties having higher ratios and 17 counties having lower.

1962

1962 was the year in which many counties and districts began to experience a downward trend in fertility. For others, however, 1962 represented the final year of the post-baby boom.

Table XVI shows the number of counties and districts which increased or decreased with respect to the five measures of fertility during 1962. There were 12 counties and districts, for example, which showed an

Table XVI – Directional Movements in Fertility, Counties and Districts, 1962

	Crude Birth Rate	General Fert. Rate	Total Fert. Rate	Gross Reprod. Rate	Child/Woman Ratio	Total	Average
Increases over 1961	12	16	18	20	21	87	17
Decreases over 1961	39	37	36	34	28	174	34
No Change	3	1	0	0	5	9	1
Total	54	54	54	54	54	270	52

<sup>9</sup>For this study all rates except the crude rates are based on females aged 15-49. Births occurring outside these age groups are not considered. In 1968, however, these births represented only 100 out of a total of 126,257.



use in the crude birth rate over the 1961 re, 39 counties and districts which showed decrease, and three which remained the e. On the average, decreases in fertility s outnumbered increases two to one. It ears then, that for about two-thirds of ario's counties and districts, the year 2 marked the beginning of the large fer- y declines of the 1960's.

In 1962, the District of Kenora had the est levels of fertility among the districts counties. Kenora ranked first in the le birth rate, general fertility rate, total lity rate, and gross reproduction rate, e ranking third in child-woman ratio. e fertility indexes for Kenora averaged 5 across the five fertility rates, 34.5 per higher than corresponding provincial s. York and Haliburton shared the lowest s of fertility with York having the lowest fertility rate and child-woman ratio, e Haliburton had the lowest crude birth e general fertility rate and gross repro- ion rate. York's indexes averaged 90.3 e Haliburton's averaged 85.7. York nty however had a total fertility rate of 4 whereas Haliburton's was 3323.

In 1963 almost all counties had begun their nes in fertility. Table XVII indicates almost all counties showed declines in lity over corresponding 1961 rates. De- ng fertility measures outnumbered in- es four to one. Of the 54 counties and icts, for example, 48 showed declines in e birth rate and 42 showed declines in otal fertility rate.

uring 1963 Kenora and Manitoulin ed the highest fertility rates with Kenora g highest in the crude birth rate and ral fertility rate, while Manitoulin ranked in total fertility rate and gross reproduc-

**Table XVIII – Directional Movements in Fertility, Counties and Districts, 1968**

	Crude Birth Rate	General Fert. Rate	Total Fert. Rate	Gross Reprod. Rate	Child/ Woman Ratio	Total	Avg.
Increases over 1967	16	12	10	16	0	54	10.8
Decreases over 1967	38	42	44	38	54	216	43.2
Total	54	54	54	54	54	270	54

tion rate. The total fertility rate of 4874 for Manitoulin, although highest in the province, was still six per cent lower than the 1961 rate of 5191. The lowest levels of fertility were in Northumberland County which had a total fertility rate of 3169, 12.4 per cent below the provincial figure of 3618.

#### 1964-1967

The period 1964-1967 encompassed the largest fertility declines of the decade. Decreases in fertility averaged 7.1 per cent per year during this period when all indexes were considered, and 8.2 per cent for the total fertility rate itself. There were no counties or districts which showed increasing fertility trends during this period. Kenora and Manitoulin continued to lead the province in high fertility levels. The total fertility rates for these districts, however, fell from 4698 to 3528 and from 4874 to 3656 respectively. York County, although maintaining a relatively low level of fertility, did not decline as quickly as the county average. The total fertility rate index, for example, climbed steadily from 91.1 in 1964 to 95.6 in 1967. The county exhibiting the greatest change during this period was Prescott, with the total fertility rate declining from a 1963 year-end figure of 4311 to a 1967 figure of 2506 – a drop of 41.8 per cent.

#### 1968

In 1968 a slowdown in fertility declines took place. Indeed, some county and district rates began to increase slightly.

As shown in Table XVIII, 16 counties had increased crude birth rates in 1968 when compared with the 1967 figures. Counties averaged about one decrease in rate for every four increases. No county experienced a decrease in the child-woman ratio, probably due to the construction of the index. In 1968 Kenora once again had the highest levels of fertility, ranking first in all measures except the child-woman ratio. Kenora's total fertility rate of 3686 was 51 per cent above the provincial rate of 2434. Kenora was also one of the districts which showed an increase in fertility during 1968. The lowest fertility rates were shared by Muskoka, Frontenac, Welland and York, with Frontenac having the lowest total fertility rate at 2119. In general, fertility continued to decline in most counties, but these declines averaged only three to five per cent compared with declines of six to eight per cent the preceding year.

#### 1969

Provisional data indicate that by 1969 the fertility decline had levelled off. Provincial measures show a small increase in crude rates and general fertility rates, and a slight decrease in total fertility and gross reproduction rates.

From Table XIX it can be seen that, in 1969, 35 counties and districts showed increases in the crude birth rate and general fertility rate, 30 showed increases in the total fertility rate while the gross reproduction rate rose in 28 areas. The reason, once again, for no increases in the child-woman ratio, is the method of constructing the index. That is, the index measures fertility over a period of five years, not one year.

A geographical analysis reveals that counties which experienced increases in fertility in

**Table XVII – Directional Movements in Fertility, Districts and Counties, 1963**

	Crude Birth Rate	General Fert. Rate	Total Fert. Rate	Gross Reprod. Rate	Child/ Woman Ratio	Total	Average
ases 1961	4	5	12	16	16	53	10.6
ases 1961	48	49	42	38	37	214	42.8
Change	2	0	0	0	1	3	.6
l	54	54	54	54	54	270	54

**Table XIX – Directional Movements in Fertility, Counties and Districts, 1969**

	Crude Birth Rate	General Fert. Rate	Total Fert. Rate	Gross Reprod. Rate	Child/ Woman Ratio	Total	Avg.
Increases over 1968	35	35	30	28	0	128	25.6
Decreases over 1968	16	19	24	26	54	139	27.8
No Change	3	0	0	0	0	3	.6
Total	54	54	54	54	54	270	54

1969 tended to be concentrated in the northern and central parts of Ontario, as well as in the Niagara area and south-western Ontario. Counties in the southern Georgian Bay and Lake Huron areas, as well as the far western portion of Ontario continued to experience declining fertility. In the eastern portions of Ontario, no trend was evident in either direction.

In spite of the direction of fertility movement, changes during 1969 tended to be small for most counties and districts. Furthermore, since differences between 1968 and 1969 figures did tend to be small, caution should be used in interpreting directional changes. Rates are based on estimated populations, and even a small error in population could change the direction of some rates. In summary, 1969 was not a year of rapid changes in fertility.

#### Regions, 1961-1969

During the period 1961-1969 the ten economic regions of Ontario demonstrated fertility trends which followed patterns somewhat similar to the provincial rates.

Table XX shows the total fertility rates for each economic region from 1961 to 1969. All regions demonstrated a marked decline in fertility over these years. While North-eastern and Northwestern Ontario were consistently highest during this period, these two regions experienced the largest declines in fertility, with the Northeastern region declining by 39.5 per cent from 4567 in 1961 to 2761 in 1969, and the Northwestern region declining 37.7 per cent from 4477 in 1961 to 2789 in 1969. Central Ontario remained the region with the lowest fertility rates until 1968 when Eastern Ontario became lowest.

Three regions, Niagara, Lake Erie and Northeastern, showed increases in fertility in 1969 over 1968 levels. All remaining regions showed a decline. For most regions however,

changes between 1968 and 1969 were relatively small.

In summary, the districts, counties, regions and sub-regions of Ontario exhibited declines in fertility during the 1960's. Declines began slowly, reaching a peak in about 1966 and slowed up again in 1968 and 1969. On the average, fertility declined 30-35 per cent during the period 1961 to 1969.

#### Rural-Urban Differences

During the period 1961 to 1969, marked differences in fertility existed between predominantly rural counties and predominantly urban counties. Table XXI shows the total fertility rates for urban and rural counties during 1961-1969 as well as weighted averages for each year and the total period. For each year the rural county rates were higher than urban county rates, with the differences in averages ranging from 10 to 25 per cent. Between 1962 and 1968, years in which both rural and urban county fertility averages declined, the differences between the rates decreased. In 1969 however, the average rural rate increased, and again the gap be-

tween rural county fertility and urban county fertility widened.

The highest rates among the urban counties were in Peel, which averaged 3301 over the nine-year period. These rates were lower than the lowest of the rural rates, an average of 3337 in Huron County. Over the nine-year period rural county fertility averaged 18.6 per cent higher than urban county fertility. Although this evidence does not prove conclusively the demographic hypothesis that rural fertility is higher than urban fertility, it does indicate that for the province of Ontario counties which are predominantly rural do have higher levels of fertility than counties which are predominantly urban.

## VI – THE FUTURE

### The Province

Recent levels of fertility for the province of Ontario indicate that the decline in fertility so prominent in the middle 1960's, may be ending. The total fertility rate declined less than one per cent between 1968 and 1969 while the crude rate actually rose 1.2 per cent, reflecting both the levelling off of fertility and an increase in the proportion of females in the early childbearing years. It appears that provincial fertility may remain close to current levels over the next few years. With regard to the age specific rate it is possible that the older age groups (30-35-39, 40-44 and 45-49) will continue to show small declines. The age group 25-29 showed an increase in fertility between 1961 and 1969, and it is likely that further increases can be expected within this category. The performance of the 15-19 age group is not likely to change significantly. It is in

**Table XX – Total Fertility Rates, Regions, 1961-1969**

Regions	1961	1962	1963	1964	1965	1966	1967	1968	1969
Eastern Ontario	3841	3846	3791	3607	3000	2701	2487	2350	2281
Lake Ontario	3983	3818	3733	3598	3119	2782	2555	2398	2281
Central Ontario	3430	3352	3338	3249	2935	2685	2482	2351	2281
Niagara	3521	3537	3477	3381	3131	2776	2492	2284	2281
Lake Erie	3664	3651	3508	3357	2912	2688	2516	2374	2281
St. Clair	3929	3841	3739	3561	3394	2998	2710	2645	2281
Midwestern Ontario	3813	3843	3785	3658	3348	2982	2708	2622	2281
Georgian Bay	4086	4047	3949	3777	3320	2808	2688	2560	2281
Northeastern Ontario	4567	4544	4339	4133	3644	3110	2881	2749	2281
Northwestern Ontario	4477	4281	4033	3736	3446	3244	2908	2801	2281
TOTAL ONTARIO	3742	3689	3618	3475	3125	2790	2567	2434	2281



# Table XXI – Total Fertility Rates, Urban and Rural Counties, 1961-1969

## Dominantly Rural Counties

County	1961	1962	1963	1964	1965	1966	1967	1968	1969	Avg.
Albion	4727	4659	4468	4371	4134	3275	2960	2918	2733	3805
Brantford	3798	3723	3761	4036	3195	3116	2840	3195	3217	3431
Chatham	3921	4181	3747	3826	3379	2707	2952	2528	3000	3360
Essex	4533	4797	4510	4727	3839	3773	3225	3112	2617	3904
Hamilton	4357	3855	4036	4068	3326	3049	2620	2607	2860	3420
London	4148	4296	4082	3698	3350	2857	2605	2493	2506	3337
North & Addington	3793	3894	3807	3918	3377	3055	2819	3037	2731	3381
Muskoka	3924	4044	3849	3470	3099	2460	2244	2323	2660	3119
Simcoe Sound	4537	4706	4501	4084	3668	3096	3084	2605	2792	3675
Windsor	4435	4641	4311	4200	3798	2993	2506	2413	2472	3530
Weighted Average	4266	4320	4146	4016	3543	3019	2752	2687	2717	

Rural 9-Year Weighted Average = 3496

## Dominantly Urban Counties

County	1961	1962	1963	1964	1965	1966	1967	1968	1969	Avg.
Brampton	3543	3568	3533	3356	2691	2562	2423	2318	2206	2911
King	3747	3736	3685	3563	3510	3112	2793	2638	2612	3266
Mississauga	3442	3549	3408	3453	3140	2802	2493	2316	2416	3002
North York	3617	3572	3385	3177	2752	2573	2362	2229	2261	2881
Ontario	3892	3740	3495	3764	3287	2833	2537	2331	2434	3146
Scarborough	4059	4012	3812	3734	3365	2912	2630	2573	2614	3301
Stouffville	3693	3677	3605	3527	3345	3050	2721	2579	2608	3201
Thames Valley	3609	3532	3501	3245	3143	2797	2539	2279	2318	2996
Wentworth	3454	3497	3430	3325	3057	2718	2439	2223	2240	2931
York	3324	3264	3256	3166	2871	2634	2453	2317	2269	2839
Weighted Average	3485	3451	3398	3301	2984	2716	2496	2349	2332	

Urban 9-Year Weighted Average = 2946

Percent Difference – Rural Weighted Average: Urban Weighted Average

22.41 25.18 22.01 21.66 18.73 11.16 10.26 14.39 16.51

Percent Difference – Rural Overall 9-Year Weighted Average:

Urban Overall 9-Year Weighted Average = 18.67

4 age group that changes are most difficult to forecast. This is the age group most affected by changes in marriage rates, spacing of births, etc. It is likely that any large changes in fertility will be found in this age group.

The crude birth rate and the general fertility rate will probably continue to increase slightly, reflecting the increasing proportions of females entering the childbearing ages. The total fertility rate and the gross reproduction rate should remain relatively stable. The child-woman ratio, however, will con-

tinue to decline, reflecting not only the declines in fertility over the past five years, but the increasing proportion of females 15-49 as a result of the high levels of fertility in the late 1940's and early 1950's.

As mentioned in Chapter IV, the low rates of fertility during the 1960's will result in reduced numbers of females in the childbearing years 15-20 years hence.

Table XXII indicates that at 1961 crude birth rates, a total of 754,838 females would enter the childbearing years between 1976 and 1984, if mortality and migration were

disregarded. In actual fact, however only 622,438 females will be available to enter, due to the reduced fertility during the 1960's. As a result of this reduced cohort of women entering the childbearing years during this period, the rate of Ontario's population growth through births can be expected to decline. This, in turn will slow the rate of population increase over this period. Although females enter the childbearing years at age 15, their most productive years are 20-30. Therefore, the largest effect of this reduced cohort will be seen in the years 1980-1989, when this smaller cohort of women will be in their most fertile period.

Table XXIII indicates population projections for the years 1971-1991. These projections are based on constant migration and fertility rates and slightly declining mortality rates. Under these conditions it would be expected that the rate of population increase would continue to rise each year. In truth, however, the rate of increase shows a small decline during the period 1981-1986 and a larger decline between 1986 and 1991.

This decline in the rate of population increase must be attributed to smaller cohorts of women moving through the most productive childbearing years – a direct result of the low fertility rates of the 1960's.

## Counties and Districts

Fertility rate changes in the counties and districts of Ontario are more difficult to forecast than provincial rate changes. It is not likely however, that large changes in fertility can be expected in more than a few counties or districts. Districts such as Muskoka and Manitoulin showed sudden large increases in fertility between 1968 and 1969. However, it is difficult to forecast whether these sudden increases will continue. Compounding the problem is the fact that many counties, because of their population size, have only a small number of births from which to calculate rates. Manitoulin, for example had only 202 total births in 1969. A small number of births either way could greatly affect the rates. In general, however, it is probable that for the majority of counties and districts, fertility changes will be quite small. Reduced cohorts of women resulting from low fertility rates in the 1960's will have similar effects on the counties and districts of Ontario, as on the total province.

Table XXII – Expected Number of Females Entering Childbearing Years, 1976-1984  
(Migration and Mortality Excluded)

Year	Females (At 1961 Crude Birth Rate)	Females (At Actual Crude Birth Rate) (1961-1969)
1976	76,877 (25.3) <sup>1</sup>	76,877 (25.3) <sup>1</sup>
1977	78,117	75,979 (24.6)
1978	79,716	75,400 (23.9)
1979	81,561	74,090 (23.0)
1980	83,492	68,897 (20.9)
1981	85,619	64,364 (19.0)
1982	87,932	61,958 (17.8)
1983	89,864	61,428 (17.3)
1984	91,660	63,490 (17.5)
TOTAL	754,838	622,483

<sup>1</sup>crude birth rate

VII – CONCLUDING SUMMARY

The purpose of this study has been to examine the levels of fertility for the counties and regions of Ontario. Since a discussion of future provincial fertility levels is not the prime concern of this monograph, reference to the effect of changing social values on fertility has been kept to a minimum. It

must be realized, however, that in today's society, with modern birth control methods available to all, fertility may not so much be in the hands of economics or of chance, but dependent upon the changing social norms of family life. That is to say, the decision to have a child or not will rest more and more with an individual's perception of his ideal

Table XXIII – Population Projections,  
Ontario, 1971-1991

Year	Projected Population <sup>1</sup>	Average Yearly Percentage Increase
1971	7,550,200	
1976	8,121,400	1.51 (1971-1976)
1981	8,767,400	1.59 (1976-1981)
1986	9,461,900	1.58 (1981-1986)
1991	10,147,000	1.45 (1986-1991)

<sup>1</sup>See: Preliminary Population Projections for Ontario, 1971-1991, *Economic Analysis Branch, Economic and Statistical Services Division, Department of Treasury and Economics.*

family size and less and less with economic dictates or with chance. In any study of future fertility, therefore, more account must be taken of such things as desired family size, desired age at marriage, the possibilities of trial marriages, sterilization, etc. In short, the relationship between society and fertility cannot be overlooked.



## Fertility Rates for Ontario Regions, 1961-1969

ons	Age Specific Rates							Crude Birth Rate	General Fertility Rate	Total Fertility Rate	Gross Reproduction Rate	Child/Woman Ratio
	15-19	20-24	25-29	30-34	35-39	40-44	45-49					
TERN ONTARIO												
	60.3	240.1	222.0	142.8	76.2	24.9	1.8	25.4	109.7	3,841	1,856	.519
	60.4	240.4	222.3	143.0	76.3	24.9	1.8	25.1	109.2	3,846	1,868	.520
	55.6	243.0	218.1	142.3	73.6	24.3	1.2	24.5	106.1	3,791	1,853	.511
	50.5	222.9	214.9	137.4	70.5	22.9	2.2	23.4	100.7	3,607	1,751	.497
	46.4	181.5	175.5	116.2	59.7	19.0	1.6	19.7	84.1	3,000	1,460	.477
	46.6	162.8	153.9	101.9	55.8	17.7	1.5	18.0	76.6	2,701	1,305	.455
	42.9	155.6	148.5	86.9	48.0	14.3	1.8	16.9	71.5	2,487	1,208	.428
	41.7	148.3	144.6	82.5	39.0	12.6	1.3	16.4	68.5	2,350	1,152	.399
	41.2	139.1	144.7	81.3	39.5	11.4	1.1	16.3	67.4	2,292	1,115	.371
E ONTARIO												
	70.0	269.2	222.4	137.4	72.7	23.2	1.6	23.9	110.3	3,983	1,976	.548
	67.1	158.1	213.2	131.7	69.7	22.2	1.5	22.6	104.3	3,818	1,859	.544
	61.0	265.0	204.0	131.0	64.6	19.2	1.7	21.7	100.6	3,733	1,824	.537
	56.7	245.5	204.3	124.3	65.6	21.9	1.2	21.0	96.5	3,598	1,733	.520
	51.6	211.7	174.0	109.6	55.3	19.8	1.8	18.3	83.7	3,119	1,525	.501
	53.7	180.2	158.2	93.6	52.2	16.1	2.4	16.7	75.8	2,782	1,338	.473
	46.0	175.1	145.1	84.5	42.5	16.9	.8	15.6	70.3	2,555	1,233	.446
	48.3	161.3	142.3	75.8	37.6	13.6	.7	15.0	67.1	2,398	1,184	.416
	48.6	161.0	144.8	75.7	34.3	12.6	.9	15.3	67.7	2,390	1,164	.389
TRAL												
	68.1	212.3	197.8	126.5	62.3	17.4	1.6	25.3	101.6	3,430	1,670	.459
	66.5	207.5	193.3	123.6	60.9	17.0	1.6	24.3	98.5	3,352	1,627	.465
	60.0	205.9	195.7	127.8	59.7	17.5	1.0	24.1	97.7	3,338	1,631	.465
	61.8	196.1	190.3	124.5	58.9	17.0	1.1	23.5	95.0	3,249	1,572	.457
	62.0	170.6	172.0	111.7	55.0	14.6	1.0	21.3	86.1	2,935	1,424	.446
	60.9	158.1	155.5	97.7	49.6	14.3	1.1	19.8	79.2	2,685	1,318	.422
	55.5	149.8	145.4	89.1	43.9	11.8	.8	18.7	74.0	2,482	1,212	.398
	51.2	142.2	140.0	84.8	40.9	10.2	.9	18.1	70.9	2,351	1,138	.373
	49.4	139.5	141.6	83.9	37.4	9.3	.7	18.1	70.4	2,309	1,127	.349
GARA												
	64.0	228.6	203.7	125.6	62.7	18.0	1.5	23.4	99.6	3,521	1,711	.489
	64.3	229.6	204.6	126.2	63.0	18.1	1.5	23.2	99.1	3,537	1,718	.490
	55.4	226.6	206.2	127.2	60.5	18.6	.8	22.6	96.5	3,477	1,669	.488
	52.7	222.1	199.7	123.2	59.4	17.5	1.5	22.0	93.7	3,381	1,631	.477
	55.7	201.5	182.1	111.6	57.6	16.4	1.3	20.5	87.3	3,131	1,531	.463
	57.0	173.9	166.4	93.0	49.4	14.8	.7	18.5	76.8	2,776	1,355	.440
	51.6	161.5	148.4	81.7	42.6	11.8	.8	16.7	71.2	2,492	1,206	.414
	46.4	145.4	137.7	77.5	39.5	9.3	1.0	15.9	65.9	2,284	1,100	.387
	47.3	148.2	145.9	74.7	36.4	9.4	.7	16.5	67.7	2,313	1,123	.362
E ERIE												
	74.2	238.3	209.6	124.0	65.0	20.3	1.3	24.1	105.1	3,664	1,784	.494
	73.9	237.5	208.9	123.6	64.8	20.2	1.3	23.7	103.5	3,651	1,774	.496
	64.4	236.4	194.5	124.6	60.9	19.7	1.0	22.8	99.5	3,508	1,678	.494
	56.2	213.9	203.4	120.6	58.1	17.8	1.3	21.8	94.9	3,357	1,644	.483
	57.5	184.3	171.1	99.5	53.4	15.4	1.1	19.2	83.1	2,912	1,405	.468
	56.4	163.0	159.7	93.3	50.7	13.4	1.1	18.0	77.4	2,688	1,293	.446
	52.1	154.7	152.9	84.9	45.9	11.9	.8	17.3	73.4	2,516	1,230	.420
	48.5	153.6	149.8	75.4	37.5	9.5	.5	16.7	70.4	2,374	1,170	.391
	47.8	152.9	154.7	82.7	35.4	9.6	.6	17.4	72.3	2,419	1,176	.366

## Fertility Rates for Ontario Regions, 1961-1969

Regions	Age Specific Rates							Crude Birth Rate	General Fertility Rate	Total Fertility Rate	Gross Reproduction Rate	Child/Woman Ratio
	15-19	20-24	25-29	30-34	35-39	40-44	45-49					
ST. CLAIR												
1961	64.5	260.9	219.4	137.5	77.2	24.0	2.2	25.0	111.3	3,929	1,937	.541
1962	63.0	255.0	214.5	134.4	75.5	23.5	2.2	24.1	107.7	3,841	1,900	.540
1963	54.5	245.4	217.2	132.8	72.9	23.9	1.1	23.2	103.8	3,739	1,809	.535
1964	54.2	230.3	203.7	126.4	73.7	22.3	1.6	22.2	98.9	3,561	1,745	.520
1965	60.8	217.8	195.2	118.4	65.2	19.5	1.9	21.4	94.8	3,394	1,626	.502
1966	60.4	196.3	169.5	97.4	56.3	18.6	1.1	19.3	85.0	2,998	1,457	.478
1967	55.6	185.9	153.2	84.0	46.6	15.6	1.1	17.9	78.1	2,710	1,304	.450
1968	52.6	180.1	161.2	82.8	39.9	11.6	.8	17.8	76.9	2,645	1,256	.420
1969	52.3	180.2	158.5	79.1	37.8	11.4	.7	18.0	76.8	2,600	1,261	.393
MIDWESTERN ONTARIO												
1961	62.9	243.1	215.3	140.1	73.5	26.5	1.2	24.2	108.1	3,813	1,861	.522
1962	63.4	245.0	217.0	141.2	74.1	26.7	1.2	24.2	108.6	3,843	1,885	.526
1963	56.8	243.0	221.2	142.2	67.9	24.4	1.4	23.6	106.0	3,785	1,860	.525
1964	55.8	232.2	211.0	136.3	70.2	24.3	1.7	23.0	102.8	3,658	1,782	.515
1965	58.0	208.2	195.7	118.7	65.2	21.9	1.9	21.4	95.0	3,348	1,637	.502
1966	54.2	183.6	172.8	107.1	59.9	17.5	1.4	19.5	83.7	2,982	1,437	.481
1967	49.3	168.6	158.4	98.5	50.5	15.7	.6	18.1	78.7	2,708	1,303	.454
1968	45.2	163.3	163.6	90.6	46.5	14.2	.9	17.9	77.0	2,622	1,292	.423
1969	47.2	161.9	165.2	92.0	41.1	12.6	1.0	18.2	77.6	2,605	1,270	.396
GEORGIAN BAY												
1961	73.3	276.0	220.1	139.0	78.8	27.1	2.8	22.8	110.5	4,086	1,965	.542
1962	72.6	273.4	218.0	137.6	78.1	26.8	2.8	22.2	108.0	4,047	2,008	.541
1963	60.5	278.7	216.1	136.2	72.3	24.4	1.6	21.3	103.9	3,949	1,931	.536
1964	58.1	256.5	213.8	132.1	68.0	25.0	1.9	20.3	99.0	3,777	1,811	.522
1965	53.6	230.1	187.8	110.0	60.5	20.0	1.9	17.9	87.2	3,320	1,607	.504
1966	52.7	186.9	146.7	97.7	56.5	19.8	1.3	15.6	75.3	2,808	1,376	.477
1967	50.1	174.3	155.5	95.1	48.0	13.3	1.2	15.2	72.7	2,688	1,315	.449
1968	48.5	171.5	152.1	80.7	45.8	12.1	1.2	14.8	70.0	2,560	1,231	.419
1969	51.3	174.0	159.2	76.2	37.0	12.2	1.0	15.2	71.2	2,555	1,241	.393
NORTHEASTERN ONTARIO												
1961	85.9	297.0	243.6	160.3	91.2	33.3	2.0	31.1	138.4	4,567	2,251	.645
1962	85.5	295.5	242.4	159.5	90.7	33.1	2.0	30.2	135.3	4,544	2,235	.640
1963	69.8	284.3	240.1	153.8	86.7	30.9	2.1	28.3	127.2	4,339	2,103	.630
1964	61.2	272.6	232.1	146.2	81.8	30.2	2.4	26.7	119.7	4,133	2,023	.610
1965	62.3	233.5	199.4	129.8	74.0	27.2	2.5	23.5	105.3	3,644	1,809	.585
1966	63.6	200.9	168.7	106.9	58.6	21.0	2.3	20.3	90.7	3,110	1,530	.561
1967	64.0	193.2	153.0	93.4	54.1	17.1	1.4	19.4	85.5	2,881	1,395	.529
1968	61.6	198.0	143.0	84.1	44.3	17.5	1.2	19.0	82.9	2,749	1,359	.493
1969	59.3	190.6	156.5	83.7	46.6	14.5	1.0	19.5	84.0	2,761	1,341	.461
NORTHWESTERN ONTARIO												
1961	99.2	289.9	233.6	155.8	83.1	29.1	4.6	28.5	128.6	4,477	2,207	.585
1962	94.9	277.3	223.4	149.0	79.4	27.8	4.4	26.9	121.7	4,281	2,089	.582
1963	70.8	263.8	231.5	134.6	76.9	26.6	2.3	25.0	113.2	4,033	1,956	.573
1964	63.9	244.6	205.5	132.5	72.1	25.8	2.8	23.2	104.3	3,736	1,822	.555
1965	67.4	223.4	185.3	120.3	66.1	24.0	2.6	21.5	96.5	3,446	1,677	.533
1966	65.6	203.0	179.4	112.4	63.4	23.1	1.8	20.4	95.1	3,244	1,567	.509
1967	69.4	191.8	157.3	94.8	49.5	16.8	1.9	18.9	83.9	2,908	1,409	.479
1968	60.9	192.5	154.7	87.7	46.8	16.2	1.4	18.6	81.5	2,801	1,392	.447
1969	59.2	191.2	164.9	84.6	41.5	15.1	1.3	18.9	82.1	2,789	1,369	.418



# Fertility Rates for Ontario Regions, 1961-1969

Regions	Age Specific Rates							Crude Birth Rate	General Fertility Rate	Total Fertility Rate	Gross Reproduction Rate	Child/ Woman Ratio
	15-19	20-24	25-29	30-34	35-39	40-44	45-49					
TOTAL – ONTARIO												
51	69.5	239.8	211.6	134.2	69.8	21.9	1.6	25.3	108.2	3,742	1,824	.508
52	64.5	239.9	210.5	133.9	65.6	21.9	1.4	24.6	105.6	3,689	1,796	.511
53	60.3	233.7	208.1	133.1	66.2	21.1	1.2	23.9	102.9	3,618	1,759	.508
54	57.8	219.7	202.4	128.6	64.6	20.4	1.6	23.0	98.6	3,475	1,686	.499
55	58.3	192.9	180.6	114.5	59.3	17.8	1.5	20.9	89.0	3,125	1,521	.486
56	57.4	171.3	160.2	98.8	52.8	16.2	1.3	19.0	80.3	2,790	1,361	.467
57	53.4	162.0	149.2	88.6	45.9	13.4	1.0	17.8	74.8	2,567	1,247	.427
58	50.1	155.1	145.0	83.0	41.1	11.5	1.0	17.3	71.7	2,434	1,184	.398
59	49.2	152.2	148.4	82.3	38.3	10.7	.8	17.5	72.0	2,411	1,174	.373

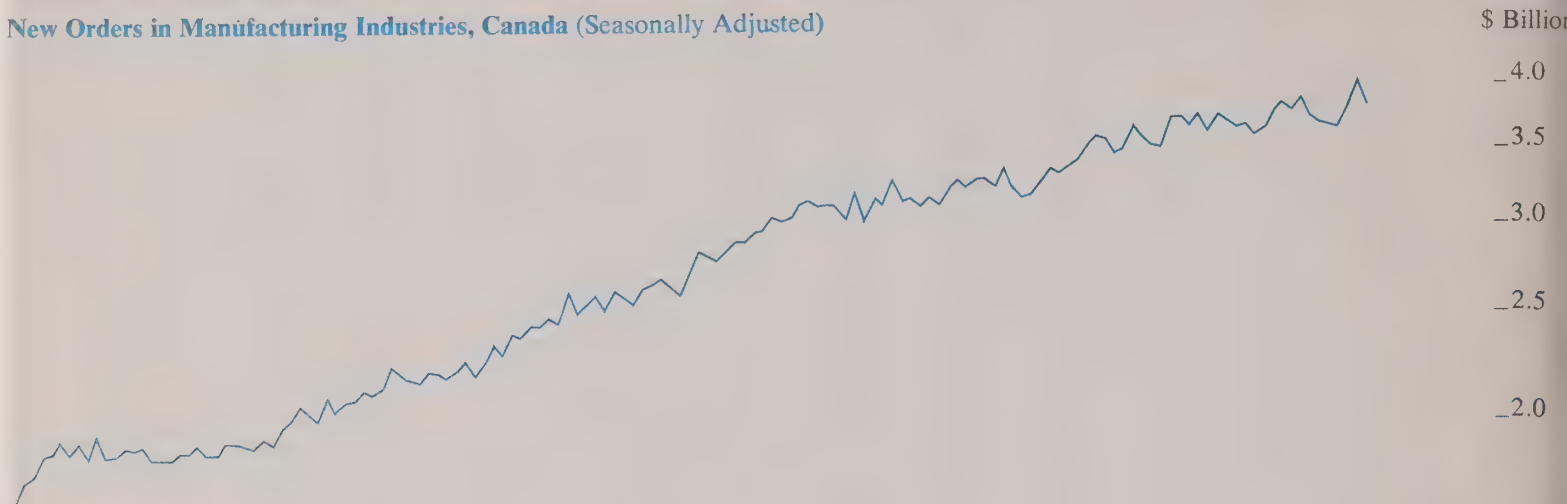
# Selected Economic Indicators

## Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



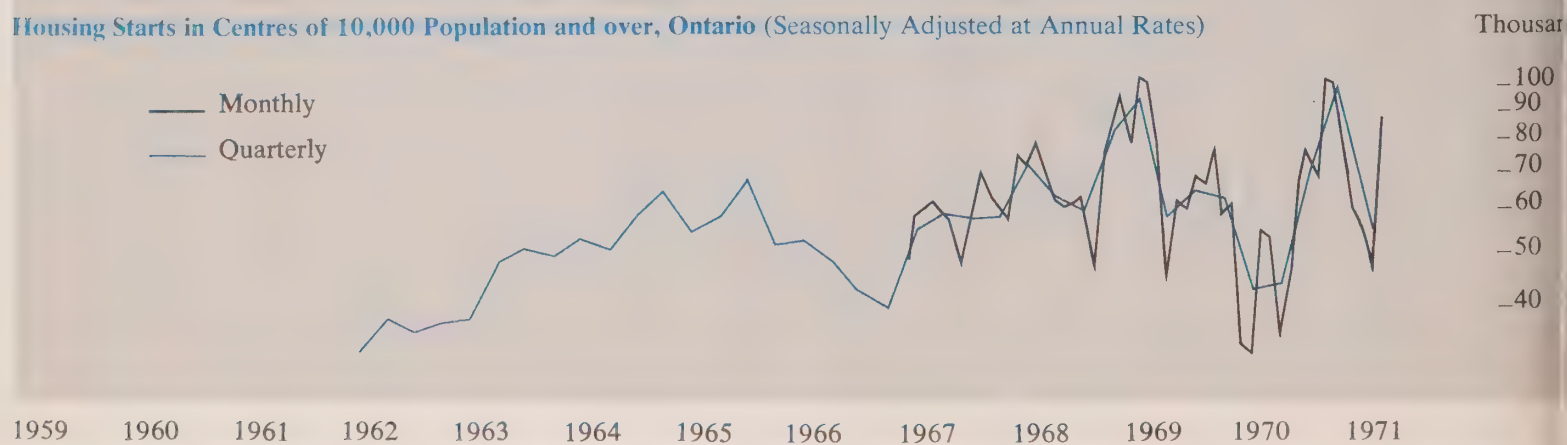
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Commercial/Institutional and Industrial Construction Contracts, Ontario (Seasonally Adjusted)



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)





## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

\$ Billion  
Scale L1  
\_35  
\_30  
\_25  
\_20  
\_15

**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Index  
Scale L2  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion  
Scale L1  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35

— Current Dollars  
— Constant (1957) Dollars

new series  
constant (1961) dollars

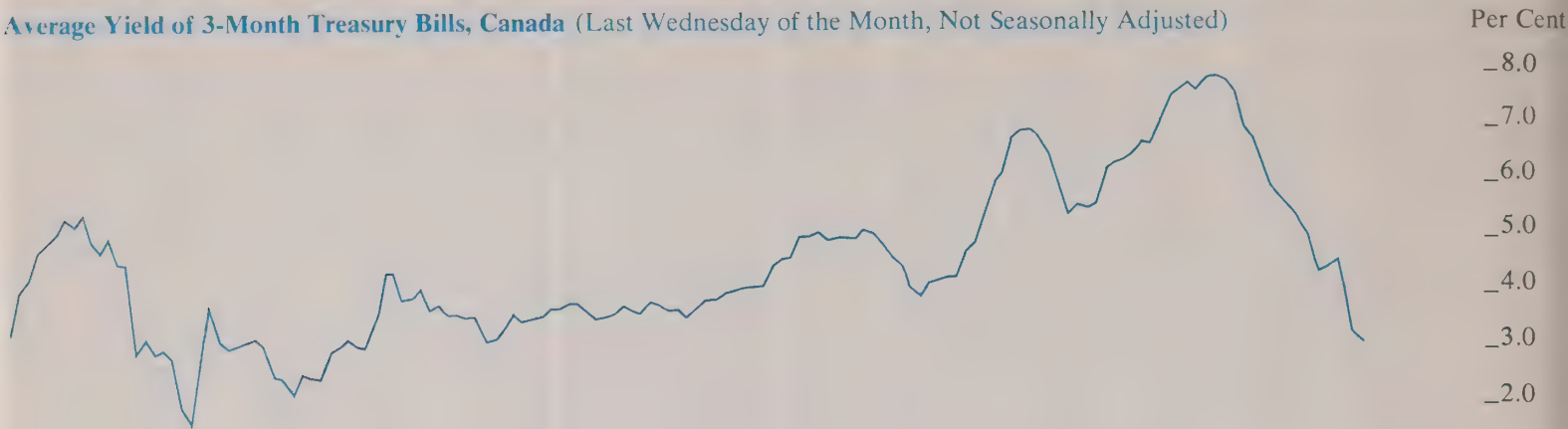
**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Dollars  
Scale L1  
\_3.50  
\_3.00  
\_2.50  
\_2.00

1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

# Coincidental and Lagging Indicators

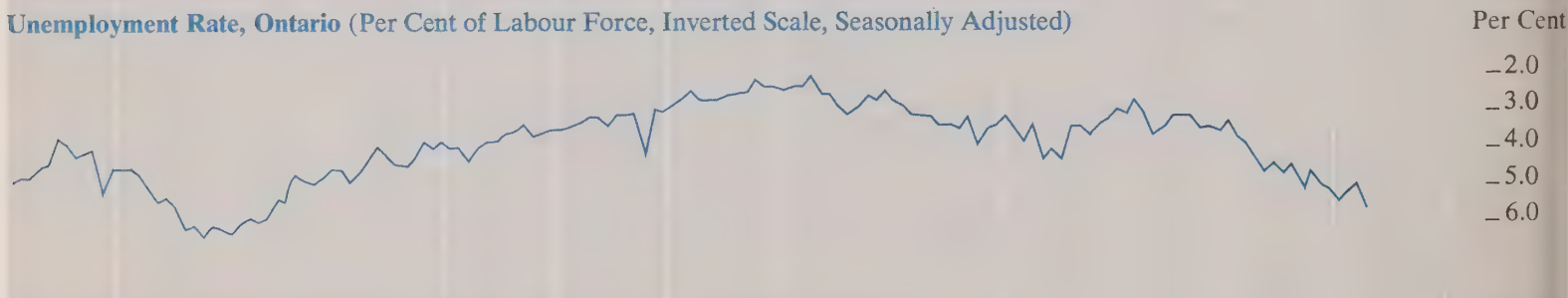
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



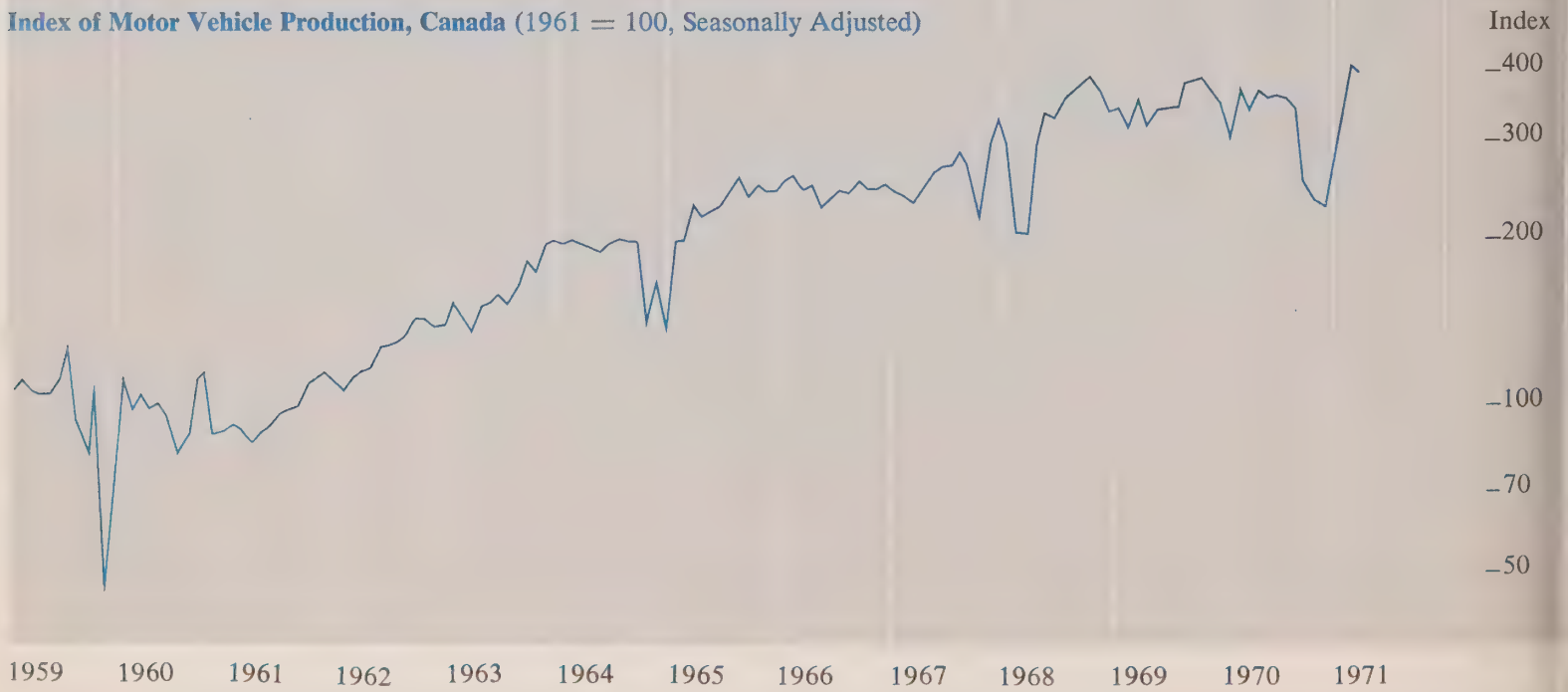
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)





	1970												1971			
	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April		
Leading Indicators																
Average Weekly Hours Worked in Manufacturing	39.5	39.8	39.9	40.6	39.5	40.0	39.6	39.5	39.4	40.1	39.2	38.8	39.1			
New Orders in Manufacturing Industries <sup>c</sup>	3,682	3,795	3,771	3,852	3,804	3,883	3,754	3,697	3,689	3,686	3,885	4,034	3,859			
Commercial/Institutional and Industrial Construction Contracts	112.1	119.7	82.0	103.0	122.9	142.1	138.5	109.6	75.7	82.9						
Urban Housing Starts (Annual Rate)	55,700	53,900	37,200	45,200	67,500	77,500	69,200	106,000	103,800	82,300	60,600	55,600	48,400	88,200		
Money Supply <sup>c</sup>	28,850	28,997	29,260	29,629	29,812	30,042	30,194	30,624	31,197	31,696	32,135	32,511	33,130			
T.S.E. Industrial Index <sup>u</sup>	185.17	171.08	154.21	151.53	157.36	160.28	165.8	162.1	168.7	174.4	178.1	177.4	185.3	181.6		
Business Failures <sup>u</sup>	82	54	65	77	73	48	55	71	74	71	71	70	100			
Business Failures — Liabilities <sup>u</sup>	4.0	2.2	3.4	8.1	3.1	2.8	5.3	8.1	5.8	7.7	11.6	4.5	5.2			
Coincidental and Lagging Indicators																
Gross National Product <sup>c</sup> (Annual Rate)	82,684			83,824			84,988									
Average Hourly Earnings in Manufacturing																
3-Month Treasury Bill Rate <sup>u</sup>	7.00	6.78	6.34	5.94	5.70	5.51	5.39	5.01	4.40	4.44	4.68	4.06	3.41	3.03		
Cheques Cashied in Clearing Centres <sup>1</sup>	6,661	6,487	6,313	6,386	6,358	6,774	7,184	6,945	6,475	6,553	6,589					
Retail Trade	884	906	904	887	918	902	930	896	903	910	900	941	947			
Labour Force	3,099	3,111	3,174	3,162	3,121	3,129	3,145	3,166	3,167	3,151	3,215	3,223	3,197	3,207		
Employed	2,977	2,978	3,035	3,025	2,976	2,996	3,003	3,030	3,020	2,996	3,042	3,054	3,040	3,023		
Unemployed	115	130	137	134	142	142	158	147	156	162	173	169	157	184		
Unemployed as % of Labour Force	3.7	4.2	4.3	4.2	4.5	4.5	5.0	4.6	4.9	5.1	5.4	5.2	4.9	5.7		
Wages and Salaries	1,550	1,547	1,571	1,586	1,584	1,601	1,596	1,600	1,611	1,619	1,646					
Index of Industrial Employment	132.7	132.1	131.7	131.4	131.1	131.7	130.2	130.0	129.7	132.0	132.1					
Index of Industrial Production <sup>c</sup>																
Total Manufacturing <sup>c</sup>	171.5	172.4	170.5	170.2	170.0	171.0	169.1	168.6	171.5	170.5	171.7	172.4	172.1			
Non-Durables <sup>c</sup>	168.1	170.0	167.5	167.4	165.4	166.5	163.1	164.3	165.5	165.1	167.1	168.3	167.8			
Durables <sup>c</sup>	152.8	154.8	155.0	152.4	152.8	151.8	152.2	152.0	155.3	152.9	152.7	150.0	150.2			
Mining <sup>c</sup>	186.7	188.6	182.8	185.8	181.7	184.4	176.4	179.9	178.4	180.6	185.3	191.5	190.2			
Electric Power and Gas Utilities <sup>c</sup>	170.6	164.2	166.6	170.8	173.4	174.6	178.2	175.4	186.7	180.9	177.4	176.4	176.3			
Primary Energy Demand (Annual Rate)	203.0	206.4	203.7	205.1	206.1	205.9	208.4	195.0	194.8	201.0	203.2	201.8	201.8			
Exports (including re-exports) <sup>c</sup>	62.94	63.39	61.60	63.35	65.03	65.68	66.80	65.56	64.32	66.79	67.62	67.76	68.14			
Imports <sup>c</sup>	1,410.1	1,439.0	1,434.1	1,392.2	1,422.7	1,321.1	1,391.3	1,416.0	1,479.8	1,312.0	1,440.0	1,391.0	1,503.0	1,392.0		
	1,242.6	1,191.6	1,207.1	1,182.5	1,187.5	1,162.3	1,184.5	1,006.0	1,138.0	1,020.0	1,128.0	1,182.0	1,339.0	1,178.0		
Unclassified Indicators																
Foreign Exchange Reserves <sup>c,u</sup>	2,936	3,179	3,406	3,650	3,689	3,848	3,785	3,831	3,871	3,813	3,816	3,868	3,944			
Industrial Materials Price Index <sup>c,u</sup>	275.7	274.4	273.7	271.5	270.3	268.5	269.2	267.4	266.4	264.2	264.2	266.0	266.4			
Consumer Price Index <sup>c,u</sup>	128.9	129.7	129.6	129.9	130.5	130.5	130.2	130.3	130.3	129.8	130.3	130.9	131.3	132.2		

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.

# Ontario Economic Review Feature Articles

1963		1965 (continued)		1968	
May	Canada and the Exchange Rate	March	Significant Economic Changes in Agriculture	Jan.-Feb.	The Economy in 1967
June	Portable Pensions — The Ontario Approach	April	The Growth and Development of the Furniture Industry in Ontario	Mar.-Apr.	Trade Liberalization and the Forest Industries
July	Population Growth in Ontario	May	The Institutional Investor and the Securities Market	May-June	Potato Marketing in Ontario
Aug.	Whither the Tourist Industry	June	The Growth and Development of the Motor Vehicle Industry in Ontario	July-Aug.	Budgetary Constraints to Policy Development
Sept.	Uranium and Nuclear Energy in Ontario	July	Perspective on Recent Price Movements in Canada	Sept.-Oct.	The Pattern of Consumer Expenditure at Provincial and Regional Level
Oct.	The Structure and Concentration of Ontario Manufacturing and Its Relative Position in Canada	Aug.	The Background of Federal Unconditional Grants to the Provinces 1867-1887	Nov.-Dec.	Development of Information Flows for Economic and Financial Policy Formulation
Nov.	The Forest-Based Industries of the Northeastern Ontario Economic Region	Sept.	A Progress Report on the Economic Atlas of Ontario	<b>1969</b>	
Dec.	Economic Developments in the Department of Highways	Oct.	Educational Achievement Levels in Ontario	Jan.-Feb.	Preliminary Population Projections for Ontario 1971-1991
<b>1964</b>		Nov.	Concentration and Competition in Ontario's Fluid Milk Industry (Annual Review)	Mar.-Apr.	The Solemnization of an Institutional Marriage (or the joining of the 'Treasury' with 'Economics')
Jan.	(Annual Review)	Dec.		May-June	The Reform of Taxation and Government Structure in Ontario
Feb.	Tobacco — Ontario's Major Cash Crop	<b>1966</b>		July-Aug.	St. Lawrence Seaway — Impact on Ontario
March	Canada's Requirements for New Business Machinery and Equipment from 1965 to 1975	Jan.-Feb.	Opportunity through On-the-Job Training	Sept.-Oct.	Air Pollution and the Utilization of Natural Gas in Automobile Vehicles
April	Some Impressions Arising from the First Year of Operation of the Ontario Development Agency	March	The Development of Ontario's Textile Industry	Nov.-Dec.	An Analysis of Population Growth Trends in Ontario
May	Ontario Labour Markets, 1953-1963	April	"The New Economics" and the Province of Ontario	<b>1970</b>	
June	The Approach of Regional Analysis	May-June	Progress Under the Automotive Free Trade Agreement: Some Comments	Jan.-Feb.	The Input/Output Structure of the Ontario Economy
July	The Niagara Economic Region: Present Characteristics and Prospects of the Future	July	Ontario's New Housing Program	Mar.-Apr.	Economic Aspects of Environmental Quality for Ontario
Aug.	The Development of Forestry Policy	Aug.-Sept.	Economic Education	May-June	The Public Sector and Economic Policy
Sept.	An Index of Economic Health for Ontario Counties and Districts	Oct.-Nov.	The Distribution of Personal Income in Ontario and the Ten Economic Regions	July-Aug.	Design for Development: The Toronto-Centred Region
Oct.	Preliminary Indexes of Production in Ontario	Dec.	Canada and the U.S. Guidelines	Sept.-Oct.	Geocoding — A Technique in the Development of Urban Information Systems
Nov.	A Pilot Study on Regional Labour Income in Ontario	<b>1967</b>		Nov.-Dec.	The Development of Ontario Economic Accounts
Dec.	The Growth and Development of Primary Iron and Steel in Ontario	Jan.-Feb.	(Annual Review)	<b>1971</b>	
<b>1965</b>		Mar.-Apr.	Fertility and Population Growth in Ontario	Jan.-Feb.	Tax Reform and Small Business
Jan.	Oil and Natural Gas in Ontario	May-June	Soybeans in Ontario: Production, Utilization and Prospects	March	Special Supplement— An Econometric Model for the Ontario Economy
Feb.	Ontario Regional Population Projections 1961-1986	July-Aug.	Population Migration to and from Ontario	Mar.-Apr.	Price Changes 1961-1970: An Economic Analysis
		Sept. Oct.	Towards a Theory of Provincial-Municipal Grants		
		Nov.-Dec.	Ontario's Demand for Industrial and Agricultural Machinery to 1976		











# Ontario Economic Review

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July/August 1971  
Volume 9, Number 4

Department of Treasury and Economics

Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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# Ontario Economic Review

July/August 1971  
Volume 9, Number 4

## The Ontario Economy

### Provincial-Municipal Reform: A Progress Report

Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

### Selected Economic Indicators

A publication of the  
Department of Treasury  
and Economics  
Government of Ontario

Hon. W. Darcy McKeough  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

#### About the Review

The feature article for the July/August edition of the *Ontario Economic Review* is based on Budget Paper B, Provincial-Municipal Reform: A Progress Report, contained in the 1971 Annual Budget Statement of the Hon. W. Darcy McKeough, Treasurer of Ontario and Minister of Economics.

The article provides a complete progress report of the Ontario government's long-term program of reform in provincial-municipal finance and property taxation. Property tax increases between 1967 and 1970, for example, decelerated to almost one-half their annual rate of growth in 1960-67, and in 1971 no increase in education taxes and only a moderate increase in municipal taxes is expected. This substantial improvement has been due almost entirely to increased provincial grants. Without this ongoing shift in financing from local governments to the Province, an additional \$461 million in property tax revenues would have been required to maintain local services in 1971-72. New reform measures in 1971-72 will require \$78 million.

The article was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Policy Planning Division of the Department of Treasury and Economics.

#### Indicator Charts, Pages 17-19

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 17-19 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuation. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *This applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## FEDERAL BUDGET AND TAX REFORM BILL

The 1971 federal budget, together with the government's tax reform proposals was presented to the Canadian Parliament by Finance Minister E. J. Benson on June 18, 1971. The budget is intended to be expansionary, to restore business confidence and stimulate consumer spending as soon as possible. Moderate tax relief and an escalation of the federal budgetary deficit to three-quarters of a billion dollars are the key features.

Highlights of the budget include:

- Basic individual tax exemption increased to \$1,500 from \$1,000 and to \$2,850 from \$2,000 for married couples, effective Jan. 1, 1972;
- Capital gains tax to be imposed at personal tax rate of one-half of the gains, with half of any losses deductible;
- Federal gift and estate taxes abolished effective Dec. 31, 1971;
- General corporation tax rate to be imposed at 50 per cent in 1972, reducing in stages to 46 per cent in 1976;
- Child-care expenses to be permitted as deductions up to \$500 for each child under 14, to \$2,000 maximum per family;
- Special exemption of \$650 to be granted to those 65 or older, the disabled and blind, replacing \$500 exemption at age 70;
- Reduction of up to \$150 a year to be permitted as employment expense without receipts;
- Limits raised on deductions to be permitted for pension and retirement plan contributions;
- Corporations to be permitted to deduct interest paid on borrowings to buy shares in other corporations;
- Three-year holiday for new mines and other allowances to be abolished in stages and replaced by earned depletion and other tax concessions;
- Unrealized capital gains to be taxed at taxpayer's death, but private houses exempted;
- Small businesses to be taxed at 25 per cent on the first \$50,000 of income;
- Tax dividend credit for shareholders of Canadian corporations to be increased to one-third from 20 per cent;
- Three per cent surcharge on personal and corporate income taxes to be removed July 1;

- Fifteen per cent excise tax removed immediately on television, radio, hi fi and other electronic equipment;
- Taxpayers with less than \$500 taxable income exempted from tax, effective July 1, 1971;
- Guaranteed income supplement payments to old age pensioners removed from taxable income retroactive to Jan. 1, 1971;
- Budgetary deficit for fiscal 1971-72 estimated at \$750 million on revenue of \$13.66 billion and expenditures of \$14.41 billion.

The Tax Reform Bill presented by Finance Minister Benson represents a major change from the proposals advanced in the 1969 white paper on tax reform. Almost every proposal that had met with substantial opposition has been altered. The key proposals of the white paper — the integration of personal and corporation taxes, taxation of capital gains at full rates, five-year revaluation of common shares, and the intended distinction between widely held and closely held corporations have been eliminated as has the plan to allow small corporations to be taxed as a partnership. The following summary outlines the major features of the new Tax Reform Bill:

### Capital Gains

One-half of capital gains will be included in income and taxed at normal personal or corporate rates. One-half of capital losses will be deductible by all taxpayers against one-half of capital gains. Individual taxpayers may also deduct up to \$1,000 of capital losses against other income. The deductions may be made in the current year, preceding year or in any number of subsequent years until losses are fully absorbed. Generally, gains will be taxable and losses deductible when the asset is sold, given away as a gift or upon the death of the taxpayer. Capital gains will be deferred on gifts or bequests between spouses.

Valuation day will be announced after it has passed, in order to avoid speculation. Only gains after valuation day will be taxed and then only if the realization occurred after 1971. Valuation day will have no application to an asset acquired after the new system commences. No taxpayer will be required to report any information to the Department of National Revenue on valuation day. Gains and losses at the start of the system will be measured against the actual cost of assets or their value on valuation day.

Only real gains after the start of the new system will be taxed and similarly, only real losses will be deductible. For example, a decline in an asset's value which is a return to its original cost will not be deductible.

Gains on the sale of a taxpayer's principal residence (but not on the sale of second homes such as cottages), together with up to an acre of surrounding land will be exempt. More than one surrounding acre may qualify for exemption if the owner proves that the land is needed for use and enjoyment of his residence.

As an alternative to the complete exemption of a farmer's house and one acre, he may choose a \$1,000 annual deduction from gains on the sale of his house and all his farm property.

No tax is to apply where the proceeds from the sale of personal property are less than \$1,000. Where the proceeds exceed \$1,000, the greater of \$1,000 or the cost of the assets may be deducted from the proceeds and record keeping will not be required.

### Corporations and Shareholders

The basic features of the present system of taxing corporations and their shareholders have been retained, with some modifications. The White Paper proposal of an integrated system will not be established.

The general rate of tax is to be 50 per cent in 1972. This will be reduced annually by one percentage point to 46 per cent in 1976. The Canadian-controlled private corporation is to be taxed at the rate of 25 per cent on the first \$50,000 of business income. ("Business income" being defined as profit from active financial commercial, industrial or professional business). The low rate will cease to apply once a corporation has accumulated taxable income of \$400,000. This accumulation is calculated by adding each year's taxable income after the start of the new system and by deducting four-thirds of taxable dividends paid to shareholders. This deduction cannot be made for dividends which occasion a refund. The present rules for determining associated corporations are retained to assure that the low rate is not applied to more than \$50,000 of business income by a group of selected companies.

When income taxed at the low rate is used by the corporation for non-business purposes, for example, investment in marketable securities, an additional tax is payable at the rate of one dollar for each two dollars so used. This tax would be refunded when the funds



are reinvested in business assets or paid out to shareholders as dividends. Cash and short term notes are not included as ineligible investments and will not attract this special tax.

Dividends received by a public corporation from another corporation continue to be tax exempt unless paid out of a designated surplus of a controlled corporation.

Dividends received by a private Canadian corporation from another Canadian corporation are subject to two rules:

- (1) dividends from controlled corporations (more than 50 per cent ownership), and
- (2) dividends from portfolio investment (ownership less than 50 per cent).

Dividends under (1) are tax exempt unless:

- (a) they are paid out of designated surplus, in which case the recipient is taxable, or
- (b) the dividend paid by a controlled corporation results in that corporation qualifying for a refund of tax in which case the receiving corporation pays a special fully refundable tax equal to the refund.

Dividends under (2) are subject to a special 33.33 per cent fully refundable tax.

One-half of a capital gain realized by a private corporation is to be included in its income and one-half is to be placed in a capital gains surplus account. Distributions out of that account are to be tax free. Tax paid on the one-half of the capital gain which was included in income is refundable to the corporation when it pays dividends.

Simplified rules for distributing corporate surplus are introduced, by allowing the directors to specify the type of surplus out of which a cash dividend may be paid. After the start of the new system, corporate surplus will consist of (1) "1971 undistributed income on hand", (2) "1971 capital surplus", (3) one-half of capital gains realized after the start of the system, and (4) the remaining balance made up of after tax income earned since the start of the system and differences between "tax" income and "accounting" income. A special tax of 15 per cent may be paid on all or any part of (1) above, the remaining 85 per cent can then be distributed tax-free. This distribution would reduce the opening value of the shares for capital gains tax purposes. Capital gains relating to pre-1972 transactions can also be distributed tax-free. This distribution

will similarly reduce the opening value of the shares.

In the area of business and property income the following entertainment and related expenses are to be disallowed: amounts paid to maintain or operate a yacht, camp, lodge or golf course facility; membership fees or dues in clubs which provide principally dining, recreational, or sporting facilities for members. Allowed expenses include reasonable entertainment expenses and conventions (two per year if at a location consistent with the territorial scope of the organization).

The present system of depreciation is to continue with the following modifications:

- (1) When a depreciable asset is bequeathed to someone other than the spouse the beneficiary takes over the property half-way between fair market value and original cost as a depreciation.
- (2) Each rental building costing \$50,000 or more will be placed in a separate capital cost allowance class for recapture and terminal loss purposes.
- (3) A loss created by capital cost allowance on the rental of real property may reduce other rental income but not normal rental income.
- (4) Carrying charges (interest and property taxes) on undeveloped real property will not be deductible from other income where the property is being held as an investment.

These charges will be added to the cost of the property.

Taxpayers in the professions will be required to report income and expenses on an accrual basis for fiscal years ending after December 31, 1971. Because of the difficulty in valuing unbilled time, work in process need not be brought into income unless the taxpayer chooses to do so. Accounts receivable at the start of the new system will be brought into income over a number of years, but at least 10 per cent of such deferred income must be taken into earnings each year on a cumulative basis.

For farmers and fishermen basic herd and straight line depreciation is to be phased out. Livestock farmers will be able to establish a basic herd at December 31, 1971 and any gain thereon will be tax free. No additions to the basic herd may be made after that date. When livestock is sold after December 31, 1971, the sale may be considered as out of

the basic herd or the other herd, subject to special rules.

For hobby farmers the present \$5,000 limitation will continue. In addition, amounts of interest and property taxes deducted because of this limitation may be applied to reduce any proceeds on even sale of the farm.

### Personal Income

Existing special taxes and deductions are to be replaced by a single schedule. These include the old age security tax of four per cent, the social development tax of two per cent and the special tax reduction on basic tax limited to \$20. The four per cent tax on foreign investment income is to be cancelled and the three per cent surtax will not apply in 1972.

Provincial taxes are to be calculated as a percentage of total federal tax. The new standard rate of provincial tax will be 30 per cent of total federal tax.

The result of the new rate schedule and the standard 30 per cent provincial tax will be combined rates ranging to 61.1 per cent.

All taxpayers claiming the married exemption and with income solely from wages and salaries will pay less tax than at present. Taxpayers claiming the single exemption with only employment income, will pay less tax on incomes under \$8,000. No single status taxpayer above this level will have a tax increase of more than \$78 on his employment income.

A number of new items are to become taxable. To be taxed as income are:

- (a) one-half of capital gains;
- (b) payments under an income maintenance insurance plan to which the employer has made a contribution, the contributions made by an individual since 1971 to be deductible from any payment received;
- (c) allowances paid under the Adult Occupational Training Act, not including the portion for personal or living expenses while away from home for training;
- (d) allowances paid under the Textile and Clothing Board Act;
- (e) scholarships, fellowships and bursaries with a \$500 exemption; and
- (f) amounts contributed on an employee's behalf under a public medical care plan.



employees receiving unemployment insurance benefits for part of a year may have had substantial income during the rest of the year. Benefits received are to be taxable and contributions are to be deductible.

Personal exemptions are to be raised to \$1,000 from \$1,000 for a single taxpayer, to \$2,850 from \$2,000 for a married taxpayer.

The existing formula for reducing the married exemption as the wife's income increases is to be changed. If a wife has income more than \$250 a year, her husband will receive the \$1,350 exemption claimed for her one dollar for each dollar of the excess. If he has income of \$1,600 or more, both husband and wife will file as if they were single.

An unmarried person, including a widow or widower, can claim the married exemption for supporting a brother, child or other relative if that person lives in the taxpayer's home. A taxpayer claiming the married exemption in these circumstances cannot claim the \$300 or \$550 deduction for the dependant as well.

The \$300 exemption for dependants under age 16 and \$550 for dependants 16 and over will be maintained. However, the \$300 exemption will be reduced by one dollar for each two dollars of the dependant's income in excess of \$1,000. The \$550 exemption will be reduced by one dollar for each dollar that the dependant's income exceeds \$1,050.

The special exemption of \$500 for individuals age 70 and over will be increased to \$1,000 and will be made available to all taxpayers age 65 and over.

The special deduction of \$500 for individuals who are blind or confined to a bed or wheelchair is to be increased to \$650.

The standard deduction of \$100 for medical expenses and charitable donations is to be continued.

Amounts contributed by an employer on behalf of his employees to a public medical plan will be a taxable benefit to the employee. This will not include payments for retired employees.

Medical expenses for which an individual has been reimbursed under an insurance plan are not to be treated as medical expenses.

Premiums paid by an individual to non-government medical or hospital plans are to be classed as deductible medical expenses.

The list of deductible medical expenses is to be increased to include payments to a pool or other institution for the care and

training of mentally or physically handicapped or disabled persons, including those with special learning disabilities.

There is to be a deduction for child care expenses of up to \$500 for each child under age 14, with a maximum of \$2,000 per family. This is in addition to the general deduction for children as dependants and will normally be claimed by the mother.

A deduction is to be permitted for expenses of caring for a child over age 14 and who is dependent because of mental or physical infirmity.

The deduction may be taken by the father if he is a widower, or divorced or separated. He may also take the deduction if the mother is incapable of caring for herself or children, or if she is confined for 14 days or more to a bed, wheelchair, hospital, mental hospital or prison. For such periods the father's deduction is to be limited to a maximum of \$15 per week for each child to a total of \$60 per week, subject to the overall limitations of \$500 per child or \$2,000 per family.

Qualified child care expenses include baby-sitting costs, day nursery care, and up to \$15 a week (not exceeding \$500 a year) towards lodging paid at schools and camps. Amounts paid to dependants of the taxpayer or to relatives under age 21 will not qualify. Receipts bearing the social insurance number of the individual who performed the services must be retained.

The child care expense deduction cannot exceed two-thirds of the earned income of the parent making the deduction.

A deduction for employment expenses of up to three per cent of income from an office or employment, to a maximum of \$150 a year, is to be permitted. No receipts are to be required.

The employment expense deduction is not to be permitted to a salesman, who may deduct expenses incurred in earning commissions. An individual who holds an elected office may take the deduction only to the extent that it exceeds any tax-free expense allowance he may receive. Elected members of school boards, boards of education and other elected officers may exclude one-third of their total remuneration as an expense allowance in the same way as members of provincial legislatures and elected municipal officers.

Income for purposes of the employment expense deduction is to include wages, salary and taxable benefits received from an em-

ployer, and adult training allowances and research grants. It is not to include income from a pension or retirement plan, remuneration as a corporation director or unemployment insurance benefits.

### Finance Ministers Meeting — July 12-13

In a recent statement to the Ontario Legislature the Hon. W. Darcy McKeough reported briefly on the topics discussed and the progress made at the latest federal-provincial meeting of the Ministers of Finance. Tax reform, the economic situation and intergovernmental fiscal arrangements were the major items on the Ontario agenda.

On tax reform, Mr. McKeough presented a statement outlining Ontario's views and reactions to present on the new federal income tax legislation. In his statement the Minister raised four major concerns about the content and thrust of the federal tax reform program:

- The new federal tax system does not go far enough towards providing incentives to encourage greater Canadian investment and participation in Canadian businesses. Ontario therefore, is prepared to do more along these lines on its own, with its own taxes.
- The complete withdrawal by the federal government from gift and death taxation beginning in 1972 raises serious problems of equity and revenue maintenance for the provinces. Ontario's concerns about this potential gap in the Canadian tax structure were shared by all the other provinces. Accordingly, it was agreed to refer this matter and the similar matter of provincial resource taxation to the Continuing Committee of Officials to explore ways in which future provincial tax actions could be harmonized.
- The new federal legislation persists with the exemption approach to tax relief rather than adopting the more imaginative and effective method of tax credits. Yet, nearly all provinces are in favour of the tax credit approach, which was advanced and fully documented in Ontario's papers and studies on national tax reform. Mr. Benson agreed, however, to look at this matter, particularly the possibility of incorporating provincial tax credits within the national tax collection machinery. The Ontario Department of Treasury and Economics will be setting out complete

details of the kind of property tax and sales tax credits Ontario favours and exploring with the federal government ways to implement such a credit system within the new income tax framework for the benefit of Ontario taxpayers.

- The new federal tax reform appears to have been designed completely independently of related reforms in unemployment insurance and family allowances. Since it is the combined impact of reforms in all three areas which determines the incidence of burdens and benefits on Canadian families, Ontario has strongly urged an integrated and coordinated overall approach to reform. The apparent failure by the federal government to follow this logical approach has produced a number of serious anomalies in overall incidence as well as significant disincentives for families to earn more income at some points on the income scale. These equity anomalies and disincentive effects were documented at the meeting by Ontario in a short paper containing pertinent tables and examples. Mr. Benson has agreed to study the Ontario paper and any further

details on this important consideration which are brought forward.

The second important agenda item dealt with the state of the economy. Mr. McKeough summarized Ontario's views in a short statement to the conference. Essentially, the Province's assessment indicates that the economy is moving on a recovery path, but that this recovery will take place only gradually. Comments by the federal Minister of Finance appear to confirm this assessment. Mr. Benson, however, would not set out what are the federal targets for full employment and optimal economic performance over the next 18 to 24 months, even though this was explicitly asked for by some provinces. There was a general concern about the value of the Canadian dollar and its depressing effect on industrial sectors reliant upon exports, such as the pulp and paper industry.

Major discussion of fiscal arrangements centred around a new equalization arrangement for the coming five years. Mr. McKeough reiterated Ontario's basic support for this important program to help poorer provinces but called attention to two related considerations:

- a) Huge federal equalization payments to poorer provinces are largely financed by Ontario and this has created a large fiscal drag on our economy. The federal withdrawal from Ontario probably exceeds \$2.3 billion this year.
- b) The federal equalization program should be integrated with and take into account other federal programs directed to poorer provinces, particularly the regional economic expansion program which spends over \$400 million per year towards this objective.

In any case it was agreed to recommend to the First Ministers that a new five-year equalization agreement be approved, incorporating a number of technical improvements over the existing formula.

There was little discussion on other aspects of fiscal arrangements, such as post-secondary education fiscal transfer cost-sharing programs generally. It was agreed to refer these matters and the matter of health and welfare joint programs to the First Ministers, although they are to be discussed at another meeting of Finance Ministers prior to the meeting of Prime Ministers.



Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

## INTRODUCTION

Increasing demands for social and economic services and facilities in recent years have strained severely the financial resources of the provincial and local governments. To meet these pressures, the Government presented a comprehensive plan for controlling the level and distribution of provincial-municipal tax burdens in its white paper of 1969.<sup>1</sup> This plan involved a series of complementary actions across the broad spectrum of federal-provincial-municipal taxation and finance.<sup>2</sup> At the provincial-municipal level, it was designed to meet three main objectives.

Relieve the growing pressure on the property tax by increasing grant support to municipalities and school boards, removing property tax exemptions and taking over the local government responsibilities for the administration of justice and assessment.

Improve the progressivity of the provincial-local tax structure directly by the introduction of tax rebates to residential property owners, followed by selective relief to needy pensioners and farmers; and indirectly by increasing grants, thus financing a larger proportion of local government expenditures through the more progressive provincial tax system.

Re-organize and consolidate local governments to provide them with an effective capacity for planning, to reduce disparities in tax bases between municipalities, and to improve effectiveness in the delivery of municipal services.

By 1970-71 the value to local governments of the Province's reform measures had grown to an equivalent of \$352 million a year. The amount of \$352 million comprises \$172 million in property tax rebates, \$131.7 million in increased grants, \$41.1 million in reduced local expenditure responsibilities and \$7.5 million generated by the removal of property tax exemptions on university properties and mineral processing facilities. In addition, natural growth increased basic grants by \$951 million from \$329 million in 1960 to \$1,280 million in 1970. The value of both the reform measures and the basic grant system will, of course, continue to grow each year. In 1971-72 the value of the reform package alone will increase to \$461 million.

These reforms have had two important effects. First, they have slowed the annual increase in property taxes in the period

**Table 1 — Local Government Expenditures for Selected Years<sup>1</sup>**  
(\$ million)

Year	School Board Expenditures	Municipal Expenditures	Total Local Government Expenditures
1960	522	625	1,147
1967	1,278	1,123	2,401
1968	1,510	1,280	2,790
1969	1,714	1,354	3,068
1970 (est.)	1,950	1,530	3,480
Increase in Expenditures 1960-70	1,428	905	2,333
Share of Total Increase	61%	39%	100%

Source: See Appendix, Table A.

<sup>1</sup>Expenditures include current operating costs plus capital expenditures.

1967-70 to almost half the rate for the first seven years of the decade. Second, they have reduced property tax burdens on residential taxpayers, especially needy pensioners and farmers, relative to commercial and industrial properties, thus increasing the overall progressivity of the provincial-local tax system. This article describes in detail and quantifies these two important effects. In addition, it discusses future directions and policies of Ontario's provincial-municipal reform program.

## II PROVINCIAL-LOCAL FINANCE, 1960-70

This section describes the growth and composition of local government expenditures during the 1960s and the steadily increasing role played by provincial grants in financing those expenditures as a result of Ontario's reform program. The change in the structure of finance has resulted in a marked slowdown in the upward trend of property tax levies and rates between 1967 and 1970. Also included in this section is a brief analysis of the value of the total reform package in reducing potential tax levies and rates. Finally, to put the growth of property taxes in an economic and financial perspective, they are compared with Ontario's Gross Provincial Product and provincial-local revenues in Ontario and other provinces.

### Structure and Expansion of Local Expenditures

In the past decade local government expenditures more than tripled from \$1,147 million

to an estimated \$3,480 million. Expenditures include both current operating costs and capital expenditures incurred by local governments. A breakdown of these expenditures between the two main spending units of local government — school boards and municipalities — is shown in Table 1.<sup>3</sup> School board expenditures increased about 2.7 times while municipal expenditures increased 1.4 times over the decade. Sixty-one per cent of the \$2,333 million increase in local expenditures was accounted for by school board expenditures.

<sup>1</sup>Hon. C. S. MacNaughton, "The Reform of Taxation and Government Structure in Ontario", Ontario Budget 1969, *Budget Paper B*, (Toronto: Department of Treasury and Economics). This white paper followed the extensive examination of provincial-municipal finance in the Report of the Ontario Committee on Taxation, (Toronto: Queen's Printer, 1967) and Select Committee of the Legislature, Taxation in Ontario: A Program for Reform, (Toronto: Queen's Printer, 1968).

<sup>2</sup>Ontario's views on federal-provincial tax reform are developed further in Hon. C. S. MacNaughton, Ontario Proposals for Tax Reform in Canada, and Staff Paper, Effects of Ontario's Personal Income Tax Proposals, Ontario Studies in Tax Reform 2, (Toronto: Department of Treasury and Economics, 1970 and 1971). The connection between federal-provincial and provincial-municipal tax reform is discussed further in Section IV, below.

<sup>3</sup>Included in the municipal category are expenditures of conservation authorities and children's aid societies. Excluded are expenditures of municipal enterprises such as electric and water utilities whose annual expenditures were estimated to be in excess of \$500 million during the early 1960s.

This expenditure growth is the result of dramatic changes in a few key cost and demand components. Growth in school board expenditures reflects primarily increases in the average salary of teachers, capital expenditures and enrolment increases.<sup>4</sup> The major components of increases in municipal expenditures were public works (mainly road construction and maintenance), protection to persons and property, and social assistance.<sup>5</sup>

Financing Local Government Expansion

Local government expenditures, as shown in Table 2, increased by \$2,333 million between 1960 and 1970. Ontario Government grants have financed 54 per cent of the increase. A further 36 per cent has been financed by increases in net property tax levies<sup>6</sup> and the other 10 per cent through miscellaneous revenues and borrowing.

The impact of the reform program which started in 1968 is reflected in the growing importance of grants. In the 1967-70 period, 58 per cent of the increase in expenditures was financed by grants as compared with only 50 per cent in the period 1960-67. Nine per cent of the expenditure increase in the 1967-70 period was financed by borrowing

<sup>4</sup>Between 1960 and 1968 the relative contributions to increases in school board expenditures were as follows:

Increase in average salary (including superannuation) of teachers	25%
Capital expenditures	21%
Enrolment increases	19%
Plant operation, supplies, administration, etc.	18%
Decrease in pupil/teacher ratio	9%
Transportation and interest	8%
Total Increase in School Board Expenditures, 1960-68	100%

<sup>5</sup>Between 1960 and 1969 the relative contributions to increases in municipal expenditures were as follows:

Public works (roads etc.)	26%
Protection to persons and property	20%
Social welfare	16%
Sanitation and waste removal	10%
General government	8%
Interest charges	6%
Health	2%
All Other	12%
Total Increase in Municipal Expenditures, 1960-69	100%

<sup>6</sup>Net property taxes equal taxes levied by local governments less Ontario Government tax rebates.

which was facilitated in large measure by the Ontario Education Capital Aid Corporation, the Ontario Municipal Improvement Corporation, and the Ontario Water Resources Commission. As grants and borrowing assumed increasing importance, the role of property tax levies in financing expenditure increases declined from 45 per cent in the earlier period to 26 per cent in the later period.

The increasing importance of grants is clearly illustrated in Table 3 and Figure 1. The Province's support of local government expenditures over the decade increased from 28.7 per cent in 1960-61 to 39.8 per cent in 1967-68. By 1970-71 provincial grants had reached a level of 45.5 per cent of local government expenditures. Support to municipalities increased most dramatically in the 1967-70 period.

During the same period, the Province also achieved a steady improvement in its degree of support of school board expenditures. On

the standard basis, support to school boards increased from 43.9 per cent to 50.8 per cent in the 1967-70 period. It should be noted that this percentage increase differs from that shown in Table 3 where the calculation includes capital expenditures in the base and vocational school grants plus the Province's contribution to the teacher superannuation fund in the amount of support. Moreover, the grants data in Table 3 are for fiscal years ending March 31, where the standard basis uses calendar year data. Table 4 illustrates the increases in school board support in the 1967-70 period using various measures of provincial grants and school board expenditures. On the broader definition of provincial support and school board expenditures, the Province's level of support rose from 46.8 per cent in 1967 to 54.3 per cent in 1970. Whichever measure is used, however, it is apparent that the Province's support has increased substantially since 1967.

Table 2 — Increases in Annual Expenditures, Revenues and Borrowing of Local Government

	1960-70		1960-67		1967-70	
	(\$ million)	(%)	(\$ million)	(%)	(\$ million)	(%)
Tax Levies	843	36	560	45	283	26
Other Revenue	169	7	94	7	75	7
Grants	1,254	54	626	50	628	58
Borrowing <sup>1</sup>	67	3	—26	—2	93	9
Expenditures	2,333	100	1,254	100	1,079	100

Source: See Appendix, Table A.  
<sup>1</sup>Due to year-to-year fluctuations, increases do not reflect true trends in borrowing.  
Notes: Data in this table are based on the assumption that all Ontario Government tax rebates are allocated to school boards and municipalities in proportion to their respective 1969 gross tax levies. Totals may not add due to rounding.

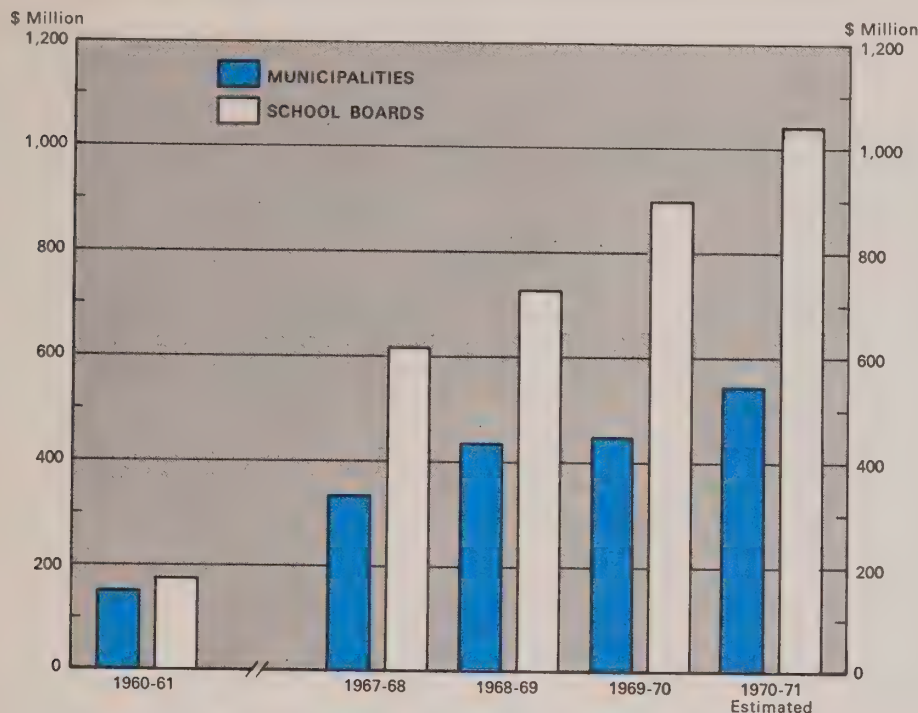
Table 3 — Provincial-Local Grants Expressed as a Percentage of Local Government Expenditures, Selected Years

	1960-61	1967-68	1970-71
School Board Grants <sup>1</sup> /Expenditures	33.9	48.3	53.2
Municipal Grants <sup>2</sup> /Expenditures	24.4	30.0	35.6
Total Grants/Expenditures	28.7	39.8	45.5

Source: See Appendix, Table A.  
<sup>1</sup>Includes 52 per cent of the residential property tax rebates and tax rebates to farmers and pensioners.  
<sup>2</sup>Includes 48 per cent of the residential property tax rebates and tax rebates to farmers and pensioners.  
<sup>3</sup>Estimated.

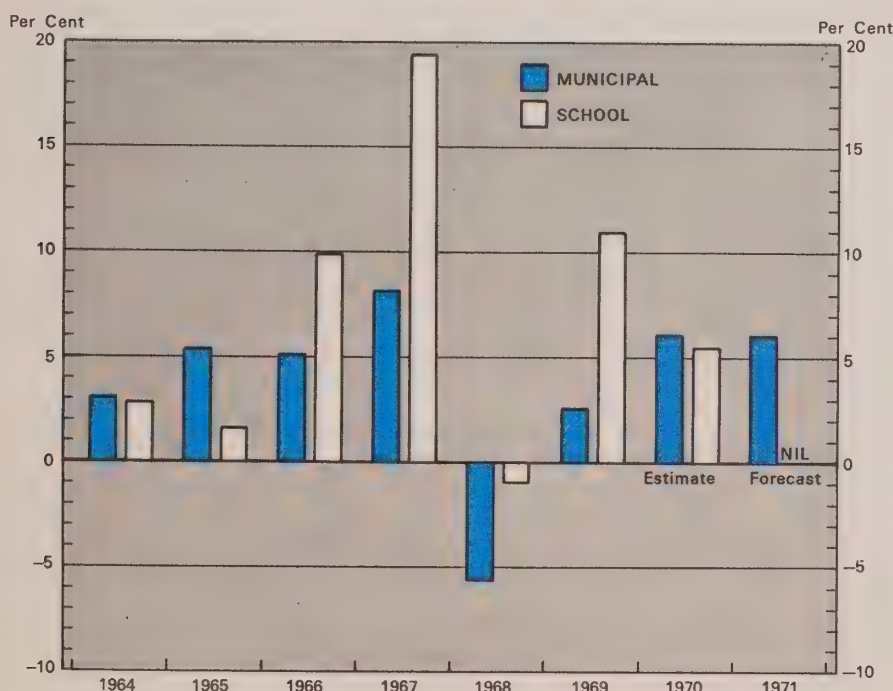


**Figure 1 – Provincial Government Grants to Municipalities and School Boards, Selected Years**



Source: Ontario Public Accounts, 1961-1970 (Toronto: Queen's Printer).

**Figure 2 – Annual Percentage Changes in Net Property Tax Rates, 1964-71**



Source: See Table 5.

<sup>7</sup>Net property taxes equal taxes levied by local governments less Ontario Government tax rebates.

<sup>8</sup>By effective tax rate is meant the ratio of net property tax paid by the taxpayer to his taxable

assessment. See footnote to Table 5 for the assumptions made in deriving these tax rates.

<sup>9</sup>For a discussion of the progressivity of provincial vis-a-vis municipal taxes, see J. A. Johnson, Incidence of Government Revenues

### Growth in Property Tax Bases, Rates and Levies

The other main financing component of local government expenditures is the property tax. During the 1960s net property taxes grew by 148 per cent from \$571 million to \$1,414 million.<sup>7</sup> This growth includes a relatively greater increase in school property taxes. In fact, net school taxes grew by 184 per cent whereas municipal net taxes grew by 118 per cent.

It was pointed out earlier how property taxes declined in importance relative to grants in the 1967-70 period. The significance of this decline is seen in Table 5 where it is shown that the rate of growth of property tax revenues decelerated from 10.3 per cent annually during the 1960-67 period to 7.7 per cent annually in the past three years. When this decline is translated into effective tax rates, the change is even more dramatic.<sup>8</sup> From 1960 to 1967, local effective tax rates rose on average by 5.4 per cent annually; in the past three years, 1967-70, this trend decelerated to 3.0 per cent annually. Slower growth in municipal tax rates accounted for most of this overall improvement, although school tax rates have also decelerated since 1967. The annual percentage changes in effective tax rates facing Ontario taxpayers are depicted in Figure 2, along with forecasts for 1971. On the information available to date, it would appear that school tax rates will not increase in 1971 and may even show an absolute decline. Municipal tax rates, on the other hand, are likely to rise at about the long-term average rate for the past decade.

### Impact of Reforms on Tax Rates and Levies

The quickening in overall grant support to local government is a direct result of provincial reform moves which started in 1968. These are shown in Table 6. The value of these provincial reforms amounted to \$352 million in 1970. Without this large shift of funds from the Province to local governments, tax levies would have grown from \$1,131 million in 1967 to \$1,766 million in 1970, rather than the \$1,414 million that was actually collected. This would have required property tax increases of 10.9 per cent per year as compared with the increase of 3.0 per cent that actually occurred.

### Property Tax Growth in Perspective

The rapid growth in property tax levies is more meaningful when put in the context of society's ability to pay taxes, as measured by

and Expenditures, Ontario Committee on Taxation, (Toronto: Queen's Printer, 1967), also O. E. Nelson "Progressivity of the Ontario Retail Sales Tax", Canadian Tax Journal, (Sept.-Oct. 1970).

Ontario's Gross Provincial Product (GPP). Between 1960-61 and 1967-68 local revenues grew slightly faster than GPP, increasing from a ratio of 4.2 per cent to 4.6 per cent. Following the Province's reform program, however, the ratio of local revenues to GPP has dropped back to 4.4 per cent in 1970. This decline again reflects the increasing ascendancy of provincial grants over property taxes in financing local government expenditures and the relative decline in local tax revenues. Local revenues were approximately 48 per cent of total provincial-local own-account revenues in 1960-61, but this proportion has been consistently reduced until, in 1969-70, it reached 29 per cent.

The increased level of support to the local sector has been financed by the greater use of the provincial tax system. Table 7 shows that provincial tax revenues have grown from 4.7 per cent of GPP in 1960-61 to 10.6 per cent in 1969-70. In 1970 provincial transfers to the local sector represented approximately 4.5 per cent of GPP, of which more than one per cent or \$352 million is directly attributable to the reform program. This significant shift of the financing burden away from the property tax base and toward alternative revenue sources reflects the Ontario Government's desire to enhance the overall progressivity of the provincial-local tax structure. Over 40 per cent of the Province's revenues are derived from the personal income and general sales taxes, both of which have been shown in separate studies to be progressive as applied in Ontario.<sup>9</sup>

*Inter-Provincial Comparisons.* An interesting comparison of the relative importance of local taxes as a source of revenue for the ten provinces is given in Table 8. Two main developments are shown.

- First, local per capita revenues increased significantly in each of the provinces during the 1960s.
- Second, these local revenues declined as a proportion of total provincial-local revenues in each of the provinces.<sup>10</sup>

Among all provinces, Ontario recorded the second lowest increase in local per capita taxes during the period, and by far the lowest increase among the central and western provinces.<sup>11</sup> Although Ontario had the highest level of local taxes in 1960 and experienced the greatest expenditure pressures associated with industrial and urban expansion, by

**Table 4 — Various Measures of Provincial Support of School Board Expenditures, 1967-70**

Definition of Provincial Support	Support Based on Revenue Fund Expenditures		Support Based on Total Expenditures	
	1967	1970	1967	1970
	Per Cent		Per Cent	
Legislative Grants	43.9 <sup>1</sup>	50.8 <sup>1</sup>	36.0	43.4
Legislative Grants 52% of Tax Rebates	43.9	56.2	36.0	48.1
Legislative Grants 52% of Tax Rebates Vocational Unit Grants	—	—	42.9	50.7
Legislative Grants 52% of Tax Rebates Vocational Unit Grants Provincial Contribution to Teachers' Superannuation Fund	—	—	46.7 <sup>2</sup>	54.0 <sup>2</sup>
Legislative Grants 52% of Tax Rebates Vocational Unit Grants Provincial Contribution to Teachers' Superannuation Fund OECAC Interest Subsidization	—	—	46.8	54.3

Source: Public Accounts of Ontario, (Toronto: Queen's Printer, 1967, 1970). Unpublished data.

<sup>1</sup>Standard basis for measuring school board support.

<sup>2</sup>Except for the fact that grants are for calendar year, data are comparable to those in Table 3.

**Table 5 — Annual Average Growth Rates in Effective Net Property Tax Revenues and Rates**

	Compound Annual Growth Rate	
	Per Cent	
	1960-67	1967-70
Municipal Tax Rates	4.4	0.9
School Tax Rates	6.6	5.1
Total Tax Rates	5.4	3.0
Net Property Tax Revenues	10.3	7.7

Source: Ontario Department of Municipal Affairs, Summary of Financial Reports of Municipalities and 1971 Municipal Directory, (Toronto: Queen's Printer, various years).

*Note:* Effective tax rate is the ratio of net property tax paid by the taxpayer to his taxable assessment. In deriving the growth in effective tax rates, a number of simplifying assumptions have been made. First, the increase in tax revenues as a result of natural growth in the assessment base has been excluded. Second, only one tax rate has been assumed for school purposes and one rate for general municipal purposes. In fact, there are two official mill rates, one for commercial and one for residential property. Third, the 1970 property tax rebates have been assumed to benefit all taxpayers, whereas in fact they have accrued only to residential property owners, farmers or needy pensioners. Finally, no account is taken of the mix of residential, farm and commercial properties — all of whose tax bases bear different relationships to tax levies because they are generally assessed at significantly different proportions of market value. Nevertheless, Table 5 indicates the general drift in tax rates over the decade. It should also be noted that increases in the effective tax rates of individual municipalities and school boards will vary widely around these average increases.

<sup>10</sup>The inter-provincial fluctuations in provincial-local revenues are dependent on total provincial expenditures, relative tax bases, tax rates, and substantial federal equalization payments. The per capita own-account provincial-local revenue

shown in the Table tends to be lower for those provinces receiving federal equalization payments than it would have been in the absence of such assistance.

<sup>11</sup>In 1967, New Brunswick abandoned poll and

personal property taxes when the province took over the major functions of local governments: health, welfare, justice and education. As a result, it recorded the smallest increase in local per capita taxes.



**Table 6 – Value of Reform Policies to Local Government, 1968-69 – 1971-72**  
(\$ million)

Reform Policy	Value of Reform Policy			
	68-69	69-70	70-71	71-72
Residential Property Tax Reduction	109.9	123.8	141.5	150.0
Tax Rebates to Needy Pensioners	—	—	14.5	18.0
Tax Rebates to Farmers	—	—	16.0	16.5
Increased Percentage Support of School Board Expenditures <sup>1</sup>	2.7	37.4	114.2	197.3
Increased Road Grants	—	—	14.5	18.2
Amortization Subsidies to Municipalities for Sewerage Projects and Water Pipelines	—	—	0.9	0.9
Increased Support for Reformed Municipal Governments	—	—	2.1	6.8
Reformed Mining Revenue Payments	—	—	—	0.4
Reformed Unconditional Grants	—	—	—	—
Metro Toronto Conservation Authority	—	—	—	1.0
Assumption of Administration of Justice <sup>2</sup>	18.0	19.2	20.3	21.3
Assumption of the Costs of Property Assessment <sup>2</sup>	—	—	20.8	22.1
Removal of Exemption on University Properties	—	—	2.5	2.8
Removal of Exemption on Mineral Processing Facilities	—	—	5.0	5.0
Removal of Exemption on Properties of CAATS	—	—	—	0.9
Removal of Exemption on Provincial Park Properties	—	—	—	0.2
<b>Total Value of Reforms in Reducing Financial Burdens on Local Governments</b>	<b>130.6</b>	<b>180.4</b>	<b>352.3</b>	<b>461.4</b>

<sup>1</sup>The value of reform is only that amount of grant attributable to raising the Province's level of support above the 1967 level of 44 per cent. Calendar year data.

<sup>2</sup>Based on the assumption that municipalities would not have substantially increased expenditures on the administration of justice and assessment had they retained these responsibilities.

1969 its local per capita tax level was among the lowest in the central and western provinces.

### III TARGET GROUPS IN LOCAL TAXATION

The Province's reforms are also aimed at reducing the regressivity of the provincial-local tax system through the introduction of property tax rebates. This section begins with a general description of the property tax structure as it existed in Ontario in the 1960s and then analyzes the differential tax burdens upon various classes of real estate and the changes in their relative positions over time. The contribution of tax rebates to the reduction in relative tax burdens on residential property owners and farmers is also analyzed.

#### The Property Tax Structure

There are really two main property taxes — the tax levied on real property (and, by implication, on the owner) and the business tax (which is levied on businessmen who are occupants of real property). There are also a variety of properties which are assessed but exempt from taxation.

*The Property Tax Base.* Property classes are distinguishable either as a result of being taxed at different mill rates or as a result of being assessed at significantly different proportions of market value. Thus there are two main property classes: the residential property class which is taxed at the low residential mill rate and the non-residential property class which is taxed at the higher

**Table 7 – Provincial and Local Government Revenues in Relation to Gross Provincial Product**  
(\$ million)

	1960-61	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70
Own-Account Local Revenues	648.7	884.5	965.8	1,070.5	1,242.9	1,267.7	1,435.3
Own-Account Provincial Government Revenues	715.1	1,346.4	1,591.2	1,962.8	2,310.0	2,747.0	3,460.1
<b>Total Provincial-Local Revenues</b>	<b>1,363.8</b>	<b>2,230.9</b>	<b>2,557.0</b>	<b>3,033.3</b>	<b>3,552.9</b>	<b>4,014.7</b>	<b>4,895.4</b>
Ratio of Local Revenues to Total Provincial-Local Revenues	47.6%	39.7%	37.8%	35.3%	35.0%	31.6%	29.3%
Ratio of Local Revenues to Gross Provincial Product	4.2%	4.4%	4.3%	4.2%	4.6%	4.3%	4.4%
Ratio of Provincial Government Revenues to Gross Provincial Product	4.7%	6.6%	7.1%	7.7%	8.5%	9.3%	10.6%

Source: Tax Structure Committee, Government Revenues and Expenditures 1960-61 to 1971-72, mimeo. Unpublished data from the Ontario Department of Treasury and Economics.

Note: Own-account revenues are those revenues levied by the government in question.

Table 8 – Inter-Provincial Comparison of Local and Total Provincial Sector Revenues<sup>1</sup>

	1960-61			1969-70			Increases in Local Per Capita Taxes over the Period 1960-61 to 1969-70
	Per Capita Property Tax and Other Own-Account Local Revenues	Per Capita Own-Account Provincial-Local Revenues	Local Revenue as a Proportion of Provincial-Local Revenues	Per Capita Property Tax and Other Own-Account Local Revenues	Per Capita Own-Account Provincial-Local Revenues	Local Revenue as a Proportion of Provincial-Local Revenues	
	Dollars	Dollars	Per Cent	Dollars	Dollars	Per Cent	
Newfoundland	11	71	15.5	29	264	11.0	164
P.E.I.	26	104	25.0	61	270	22.6	135
Nova Scotia	55	123	44.7	109	367	29.7	98
New Brunswick	52	137	38.0	75	359	20.9	44
Quebec	83	193	43.0	168	510 <sup>2</sup>	32.9 <sup>2</sup>	102
Ontario	106	223	47.5	188	641	29.3	77
Manitoba	85	154	55.2	157	513	30.6	85
Saskatchewan	104	220	47.3	205	560	36.6	97
Alberta	105	248	42.3	202	651	31.0	92
British Columbia	101	251	40.2	192	680	28.2	90

Source: Tax Structure Committee, Government Revenues and Expenditures 1960-61 to 1971-72, mimeo.

<sup>1</sup>Provincial property and business assessment taxes included in local revenues where applicable.

<sup>2</sup>Assuming a Quebec basic abatement for personal income taxation of 28% rather than 50%.

commercial mill rate. The former class has three constituent sub-classes: homes, apartments and farms. The latter class also has three constituent sub-classes: industrial (manufacturing), commercial, and "special". "Special" properties comprise certain transportation and communication properties which are partially assessed according to statutory rates and constraints. The other five sub-classes are generally assessed, on average, at significantly different proportions of market value within a municipality. Moreover, identical sub-classes have been generally assessed at differing proportions of market value among municipalities.

**The Business Tax Base.** In addition to the general property tax, the occupant of a commercial or industrial property is further assessed for purposes of business taxation at some proportion of the property's normal taxable assessment. The proportion varies from 140 per cent for distillers to 25 per cent for car park operators.<sup>12</sup>

**Tax Rates.** The residential mill rate in Metropolitan Toronto and the regional municipalities is statutorily set at 15 per cent less than that applicable to commercial and industrial properties. In other parts of the province the

residential and farm mill rates are reduced by the value of the municipal unconditional grant. In all areas farm and residential mill rates for school purposes are set at a level 10 per cent below the commercial mill rate. The resulting difference between commercial and residential mill rates is called the split mill rate.

**Exemption from Property Tax Liability.** Local fiscal capacity is reduced to the extent that a significant number of properties are granted exemption from the liability to make payment of taxes and are not liable to compensating payments-in-lieu of taxes. Such properties can be classified according to title of ownership as federal, provincial, local, or private. In the past, it has been general assessment practice to ignore or at best provide only a token assessed value for these properties. Thus, an accurate estimate of the extent of the loss to the local tax base from this source is precluded until province-wide reassessment has been completed.

**Payments-in-Lieu of Property Taxes.** The potential revenue loss is to some extent offset as a result of the payment of grants-in-lieu of prescribed local taxes by the federal and provincial governments upon crown and

crown agency properties. Payments-in-lieu of taxes by the Ontario Government and Ontario Hydro in 1969 amounted to roughly \$20 million.

#### Relative Tax Burdens on Property Classes, 1960-69

The impacts upon relative tax burdens of varying assessed value/market value ratios, business taxation and split mill rates are shown in the Appendix, Table C. The assessment/market value ratios for the municipalities included in the sample indicate that homes and farms have traditionally been assessed at a lower proportion of market value than commercial, industrial and apartment properties, the latter two classes of property having been assessed at approximately two-and-one-half times the rate upon farms and more than half as much again as the rate upon homeowners. When combined with the imposition of a business tax and a split mill rate, the tax burden upon commercial and industrial properties is significantly greater than the respective burdens upon homeowners and farmers. Indeed, the relative burden upon industrial properties would appear to have been four times that faced by a farmer.

<sup>12</sup>150 per cent and 10 per cent respectively prior to the 1968/69 Assessment Act.



### Change in Relative Tax Burdens, 1960-69

The average assessment/market value ratios for each of the main property classes for 1969 and the relative tax burdens are shown in the Appendix, Table D. This shows that the ranking of property classes according to assessment/market value ratios remains virtually unchanged when compared with the earlier period, with the exception that apartment properties are now assessed at a rate slightly below that attributed to commercial properties. On the other hand, all classes now appear on the average to be assessed at a significantly lower proportion of market value, with the ratios for the residential and apartment classes showing the greatest declines.

A summary comparison of the relative tax burdens upon the various property classes for the period 1960-63 and the year 1969 is provided in Table 9.<sup>13</sup> Even apart from the impact of the basic shelter exemption introduced in 1968, it can be concluded that the relative tax burdens upon homeowners, apartment owners and farmers have been reduced relative to commercial/industrial properties over the nine-year period as a result of greater than proportionate reductions in their ratios of assessments to market values. When the impacts of the residential property tax relief and farm tax reduction programs are included, the shift of the relative property tax burden away from residences and farms is even more dramatic. The relative burdens upon homeowners and farmers are less than one-third and one-sixth, respectively, of the burden upon industrial property.

The program of selective property tax relief for needy pensioners, as introduced in

1970, reduces the burden upon these taxpayers by a further amount.

### IV FUTURE DIRECTIONS

There are three main thrusts to the future development of the Province's reform in provincial-local finance: increasing provincial support of local governments, consolidation and simplification of the grant system, and the securing of a more progressive provincial-local tax system.

#### Increasing Provincial Support

The Government has already announced its commitment to increase its level of support of school board expenditures to 60 per cent. However, the costs of moving to 60 per cent and beyond are enormous. To have reached 75 per cent support in 1970, for example, would have required an additional \$425 million of provincial funds. To finance this amount would have required an additional 5 points on the personal income tax plus an increase in retail sales tax from 5 to 7 per cent.<sup>14</sup> These facts indicate clearly the extent to which the Province's ability to finance a greater share of local expenditures will be constrained if it is to hold the line on tax rates and fails to secure increased personal or corporate income tax abatements from the federal government. Sixty per cent support is a reasonable objective for the immediate future but it may be too low in the longer run. The Province will certainly consider the possibility of providing even greater support when finances become available.

The Province is also continuing to remove property tax exemptions as a means of increasing its financial support to municipal

governments. In 1970 it introduced compensating grants of \$25 per student to universities to enable them to begin to pay local taxes. As a further development of this policy municipalities will be allowed, in 1971, to tax properties of community colleges and provincial park land.

#### Consolidation and Simplification of the Grant System

Except in the case of those services where there is a strong provincial involvement and where provincial priorities must be maintained, the Province intends to reduce the number of conditional grants. The purpose of this policy is to enable municipalities to spend on the basis of their own priorities and to ensure that they have sufficient fiscal capacity to do so. In this context the present collection of conditional grants (listed in the Appendix, Table B) will be carefully reviewed to eliminate as many as possible and replace them with increased unconditional transfers to local government.

This reduction in the number of conditional grants will simplify the provincial-local grant system for local administrators. It will also generate significant savings as salaries and overhead costs related to the administration of grants are eliminated. Further, the Province will also continue the process of simplifying individual grants — as it has done this year with library grants. In addition to these measures, the Province is implementing a common reporting system for provincial, local government and local enterprise expenditures to enhance public understanding of the provincial-municipal segment of the government sector.

#### Towards a Progressive Local Tax Structure

The development of Ontario's property tax rebate system, together with the complementary rebates to farmers and pensioners, has increased the progressivity of property taxation in two main ways. First, along with increased municipal and education grants, the rebates have worked to control the absolute level of property taxation. Second, the rebates have improved the progressivity of property taxation by more closely relating net property taxes to ability-to-pay.<sup>15</sup>

As a further stage, however, Ontario's tax reform policy involves relating property tax burdens directly to ability-to-pay through selective credits in the personal income tax system. The Ontario Government's proposals

**Table 9 — Indices of Relative Tax Burdens**

Property Class	1960-63	1969		
		Assuming No Reforms	After Residential Property Tax Reduction Program	After Farm Tax Reduction Program <sup>1</sup>
Commercial	75	81	81	81
Industrial	100	100	100	100
Residential	41	32	27	27
Apartment	66	51	44	44
Farm	26	23	19	14

Source: See Appendix, Tables C and D.

<sup>1</sup>Assuming the Farm Tax Reduction Program had been implemented in 1969.

<sup>13</sup>For derivation see Appendix, Tables C and D.  
<sup>14</sup>To the extent that school property taxes on corporations are reduced, and corporate taxable income consequently increases, corporate

income tax revenues will rise. However, the largest part of this revenue gain will accrue to the federal government. Nevertheless, it is estimated that the Province would have gained

roughly \$25 million in corporation taxes by moving to a 75 per cent support position in 1970. This assumes that the increased support level results in lower school property taxes

for the use of personal income tax credits in controlling the incidence of property tax burdens were advanced as an integral part of the 1969 white paper on provincial-municipal tax reform. Under the present federal-provincial collection agreement, whereby the provincial income tax is collected by the federal government, the Province does not

have the right to implement selective personal income tax credits. In its 1969 white paper on tax reform the federal government admitted the possibility of allowing Ontario to introduce income tax credits to offset the burden of other provincial and municipal taxes.<sup>16</sup> In response to the federal white paper, the Ontario Government has devel-

oped a series of proposals as part of the discussion of national tax reform.<sup>17</sup> These proposals enumerate in detail the types of tax credits envisaged by the Ontario Government, both to make the income tax system itself more equitable and to integrate the main forms of federal, provincial and municipal taxes.

## Appendix

**Table A – Selected Statistics on Financing Local Government**  
(\$ million)

	1960-61	1967-68	1970-71 <sup>1</sup>
<b>School Boards</b>			
Grants	176.7	617.7	1,038.2
Net Tax Revenues	260.3	555.8	738.0
Other Revenues	11.5	26.0	53.2
Borrowing <sup>2</sup>	73.5	78.7	120.6
Expenditures	522.0	1,278.2	1,950.0
<b>Municipalities</b>			
Grants	152.4	337.3	545.1
Net Tax Revenues	310.3	575.2	675.9
Other Revenues	88.1	167.2	215.0
Borrowing <sup>2</sup>	73.8	43.0	94.0
Expenditures	624.6	1,122.7	1,530.0

Source: Ontario Department of Education, Report of the Minister of Education, Ontario, (Toronto: Queen's Printer, 1960-69).

Ontario Department of Municipal Affairs, Summary of Financial Reports of Municipalities, (Toronto: Queen's Printer, 1960-69).

Dominion Bureau of Statistics, Local Government Finance, cat. no. 68-204, (Ottawa: Queen's Printer, 1960-67).

Public Accounts of Ontario, (Toronto: Queen's Printer, 1961-70).

Unpublished data from Department of Education and the Department of Municipal Affairs.

<sup>1</sup>Estimated.

<sup>2</sup>New borrowing less repayments.

Notes: Grants data are for fiscal years ending March 31 whereas net tax revenues, borrowing and expenditures are estimated for calendar years.

Included in other revenues of school boards are the differences between calendar year and fiscal year grants. For example, school board grants for 1970 were \$10.7 million greater than school board grants for 1970-71 and this amount is included in other revenues. Such adjustments are necessary to balance calendar year data on expenditures with net tax revenues and borrowing.

Ontario Government tax rebates are allocated to school boards and municipalities in proportion to their gross tax levies.

rather than increased school board expenditures.

<sup>15</sup>For a discussion of how property taxes have been related to income (i.e. ability-to-pay) in Ontario, see J. A. Johnson, The Incidence of

Government Revenues and Expenditures, op. cit.

<sup>16</sup>Hon. E. J. Benson, Proposals for Tax Reform, (Ottawa: Queen's Printer, 1969), Chapter 7.

<sup>17</sup>Hon. C. S. MacNaughton, Ontario Proposals for Tax Reform in Canada, op. cit., and Staff Paper, Effects of Ontario's Personal Income Tax Proposals, op. cit.



**Table B – Provincial-Local Conditional Grants, 1970-71**  
(\$ Thousands)

	Value of Grant to All Municipalities 1970-71 <sup>1</sup>
<b>Agriculture</b>	
Warble Fly Control Act	44
Weed Control Act	72
Community Centres Act	1,600
ARDA, Drainage	500 <sup>2</sup>
<b>Education</b>	
Legislative Grants:	
Ordinary grants including CPP	832,304
Extraordinary grants	
Education mill rate subsidy	
Cost of education of retarded children	
Isolate boards	
Boards on tax-exempt land	
Constructing and Equipping Vocational Units	52,000
Employer Contribution to Teachers' Superannuation Fund	63,839
Library Grants	7,670
Department of Education Act:	
Arena program managers	30
Community programs of recreation	1,350
<b>Energy and Resources Management</b>	
Conservation Authorities Act:	
Acquisition and development of land	11,271
Flood control projects	
Flood control engineering study	
Recreational development in conservation areas	
Reservoirs	
Administration grant	
Parks Assistance Act	200
<b>Health</b>	
The Public Health Act:	
Oral diabetic insulin	94
Diagnostic laboratory grants	63
Health units	19,300 <sup>3</sup>
Boards of health	
Venereal Disease Prevention Act	13
<b>Highways</b>	
Highway Improvement Act:	
Road construction and maintenance	172,280
Bridges and culverts	
Connecting links	12,970
Sidewalks on King's Highways	80
Development roads	22,975
Grants to local road boards and statute labour boards	
in unorganized territory	2,350
Traffic and planning studies	1,345

**Table B – Provincial-Local Conditional Grants, 1970-71 (Continued)**  
(\$ Thousands)

	Value of Grant to All Municipalities 1970-71 <sup>1</sup>
<b>Justice</b>	
Registry Act:	
Clarification of boundaries	20
Emergency Measures Act	910
<b>Lands and Forests</b>	
Forestry Act	215
Wolf and Bear Bounty Act	70
<b>Municipal Affairs</b>	
Planning Act:	
Urban renewal	5,000
Survey, design, supervision and maintenance	135
Drainage Act	3,500
Municipal Unconditional Grants Act:	
Indigent hospitalization	2,689
<b>Public Works</b>	
Aid Remedial Works	25
Municipal Drainage	4
<b>Social and Family Services</b>	
General Welfare Assistance Act:	
General assistance	}
food and clothing	
shelter	
fuel	
special diets	
pre-added budgets	
nursing homes	
hostels	
foster children	
utilities	
household supplies	
Special assistance	}
Supplementary aid	
Administration costs	2,200
District Welfare Administration Boards Act <sup>4</sup>	—
Child Welfare Act:	
Children's aid societies	}
operating costs	
capital grants	
children of unmarried mothers	
children from unorganized territory	
child welfare — extra assistance	36,981
Day Nurseries Act	2,775
Homemakers and Nurses Services Act	1,390



**Table B – Provincial-Local Conditional Grants, 1970-71 (Continued)**  
(Thousands)

	Value of Grant to All Municipalities 1970-71 <sup>1</sup>
<b>Social and Family Services (Continued)</b>	
Homes for the Aged Act:	
Maintenance of homes for the aged	20,000
Acquisition or alteration	
Capital grants	
Private-home care	
Residents from unorganized territory	125
Elderly Persons Centres Act	20
Miscellaneous Grants	
<b>Tourism and Information</b>	
Establishment and Maintenance of Museums	96
<b>Trade and Development</b>	
Elderly Persons Housing Aid Act	350
<b>Total</b>	1,365,839

Source: Ontario Department of Municipal Affairs, Provincial Assistance to Municipalities, Boards and Commissions, mimeo (Toronto: Queen's Printer, 1970); also preliminary estimates of departments.

<sup>1</sup>Includes federal share of grants; all amounts are either preliminary or estimated.

<sup>2</sup>Excludes some drainage grants financed entirely by Ontario and some shared by the federal government.

<sup>3</sup>Excludes \$250 thousand in grants for community health facilities.

<sup>4</sup>Included in administration.

**Table C – The Local Tax Structure, 1960-63**

Property Class	Assessment as Per Cent of Market Value	Average Business Assessment <sup>1</sup>	Average Mill Rates (1962)			Implied Average Equalized Mill Rates			Index of Relative Tax Burdens <sup>2</sup>
	Median	Per Cent	Municipal	School	Total	Municipal	School	Total	(Industrial = 100)
Commercial	36	45	38	31	69	13.7	11.1	24.8	75 <sup>2</sup>
Industrial	48	45	38	31	69	18.2	14.9	33.1	100 <sup>2</sup>
Residential	32	NIL	34	28	62	10.9	8.9	19.8	41
Apartment	51	NIL	34	28	62	17.3	14.3	31.6	66
Farm	20	NIL	34	28	62	8.7	7.1	12.4	26

Source: Report of Ontario Committee on Taxation, Vol. II, op. cit.

<sup>1</sup>Assumed average rate for all types of businesses.

<sup>2</sup>Relative tax burdens include the burden of the business tax.

Table D – The Local Tax Structure, 1969

Property Class	Assessment as Per Cent of Market Value	Average Business Assessment <sup>1</sup>	Average Mill Rates (1969)			Implied Average Equalized Mill Rates			Index of Relative Tax Burdens <sup>2</sup>		
									(A)	(B)	(C)
									Assuming No Reforms	Following Residential Property Tax Reduction	Following Farm Tax Reduction Program <sup>3</sup>
	Median	Per Cent	Municipal	School	Total	Municipal	School	Total	(Industrial = 100)		
Commercial	35	38	44	48	92	15.5	16.7	32.2	81	81	81
Industrial	43	38	44	48	92	19.0	20.6	39.6	100	100	100
Residential	21	NIL	39	43	82	8.2	9.0	17.2	32	27	27
Apartment	34	NIL	39	43	82	13.4	14.5	27.9	51	44	44
Farm	15	NIL	39	43	82	5.9	6.4	12.3	23	19	14

Source: Department of Municipal Affairs, equalization data. Department of Municipal Affairs, Summary of Financial Reports of Municipalities 1969 (Toronto: Queen's Printer, 1970).

<sup>1</sup>Assumed average for all types of business.

<sup>2</sup>Relative tax burdens on "Commercial" and "Industrial" include the burden of the business tax.

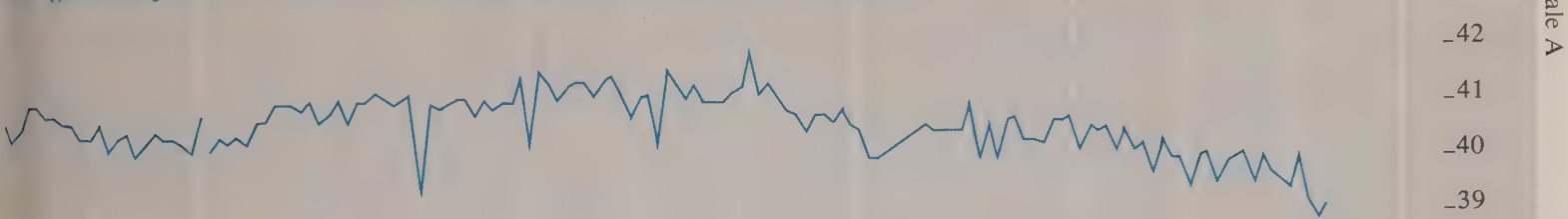
<sup>3</sup>Assuming the farm tax reduction program had been implemented in 1969 rather than 1970.



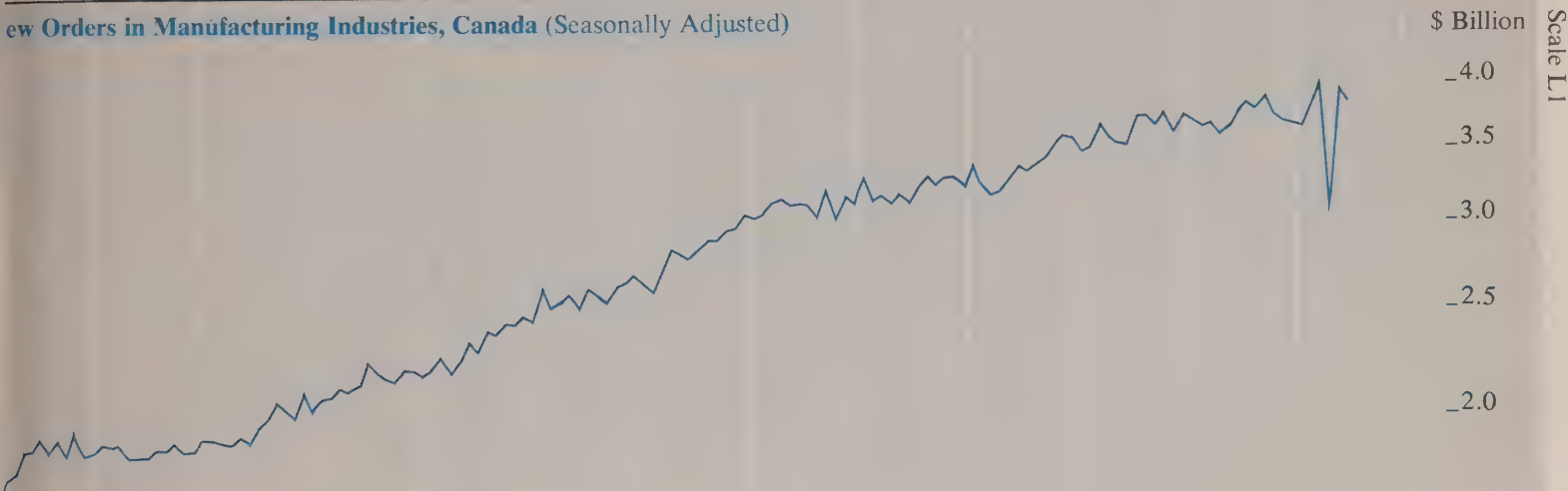
# Selected Economic Indicators

## Leading Indicators

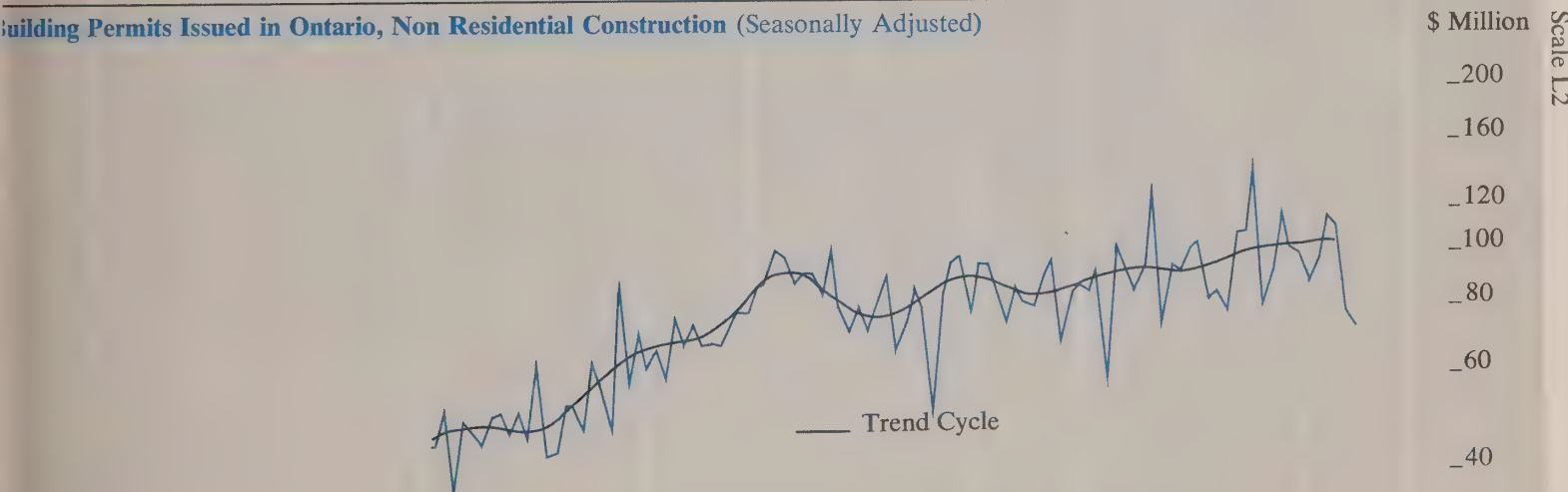
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



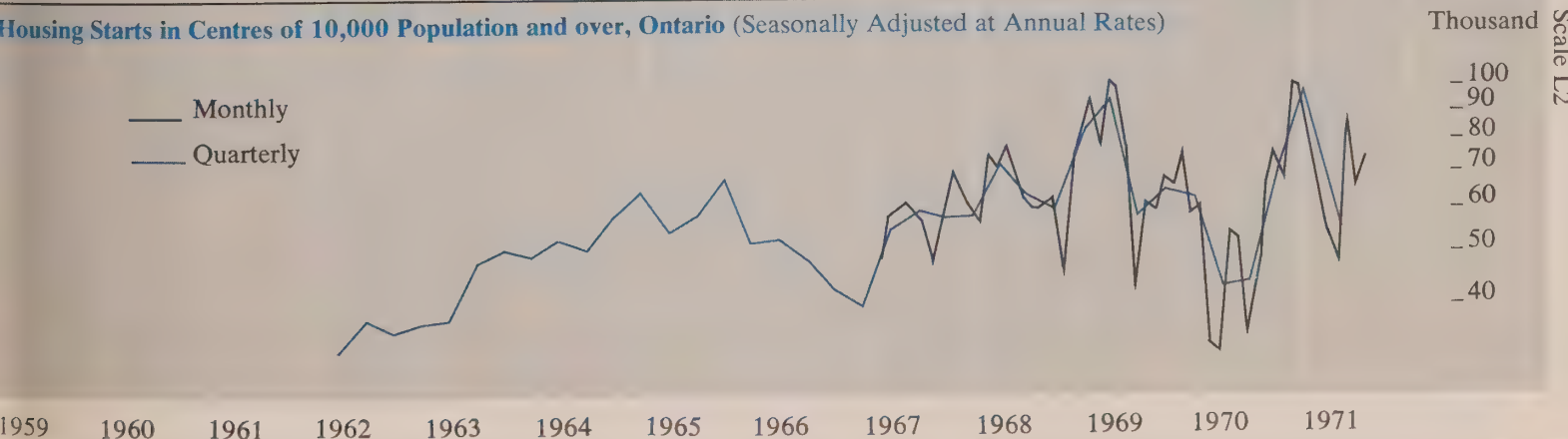
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



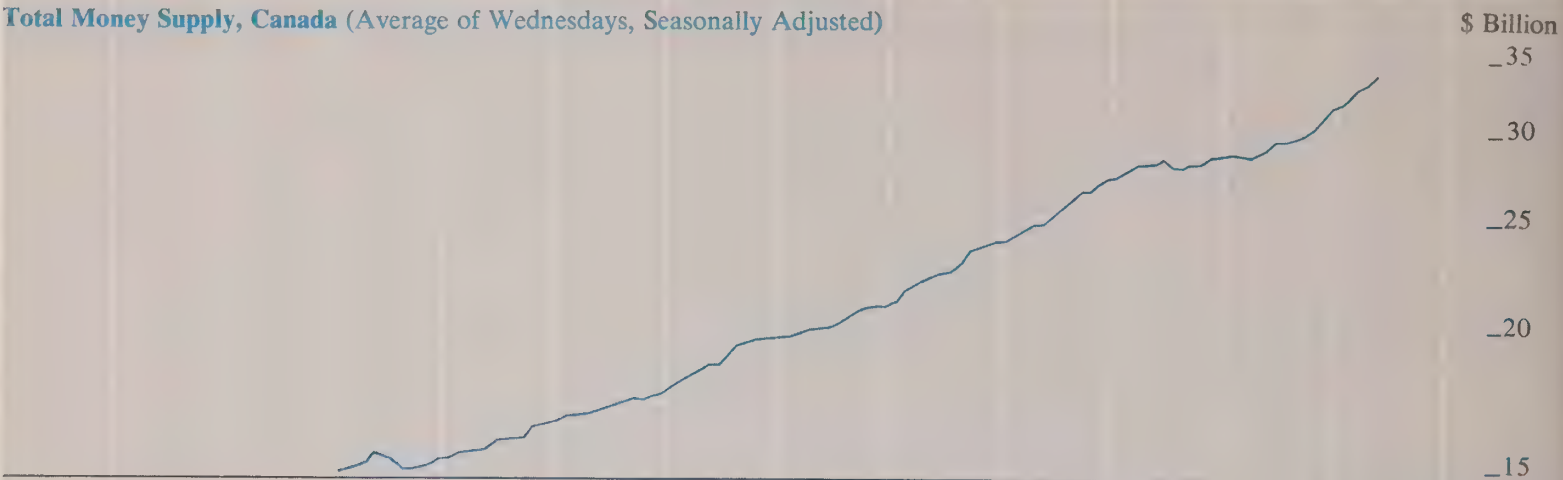
Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



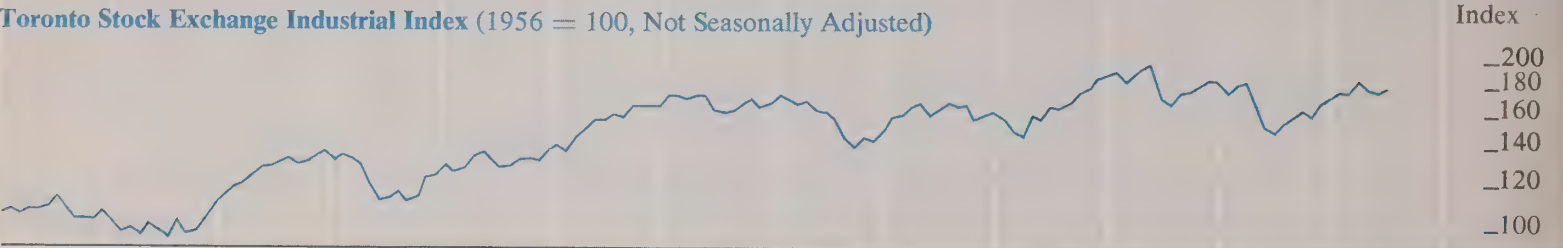
1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

# Leading Indicators

Total Money Supply, Canada (Average of Wednesdays, Seasonally Adjusted)

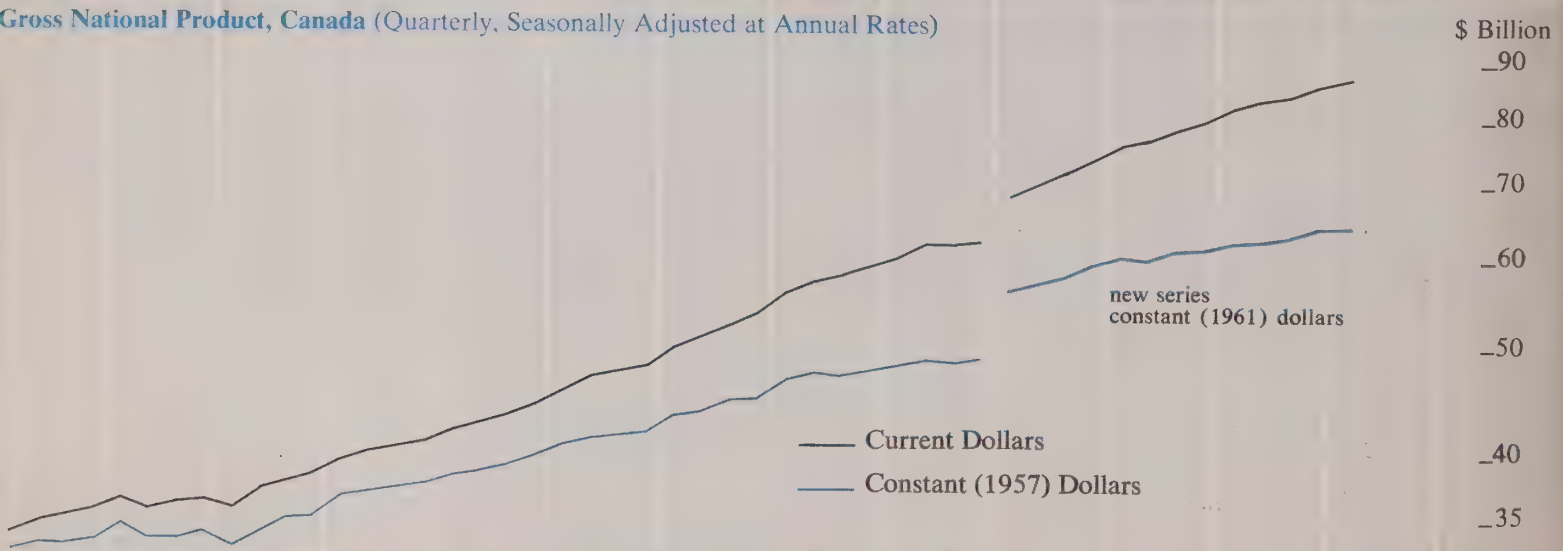


Toronto Stock Exchange Industrial Index (1956 = 100, Not Seasonally Adjusted)

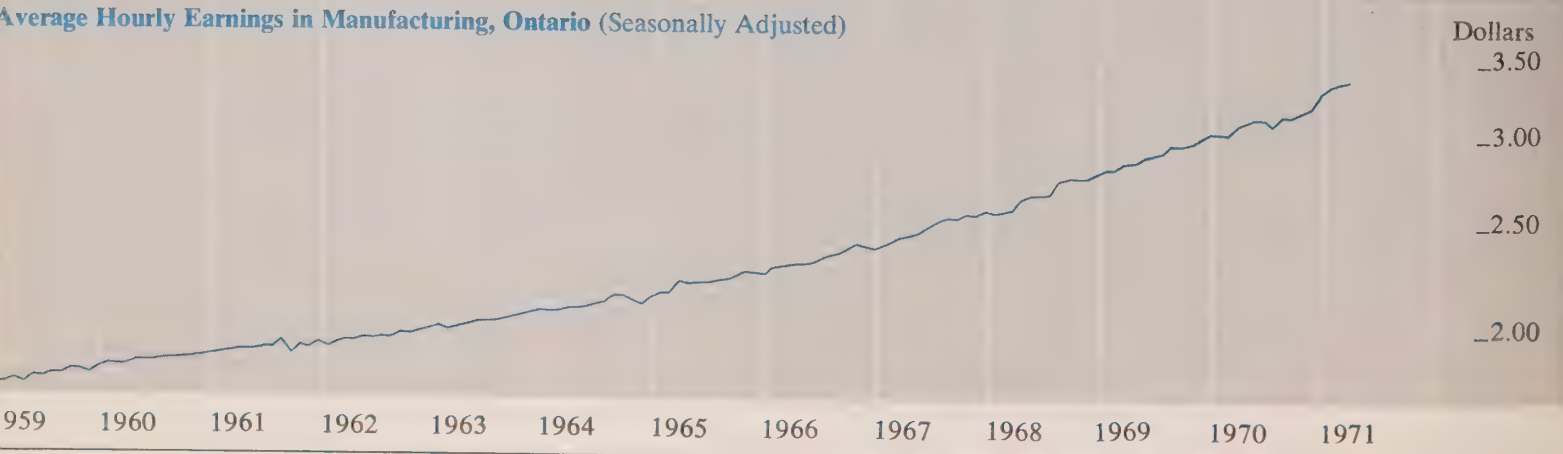


# Coincidental and Lagging Indicators

Gross National Product, Canada (Quarterly, Seasonally Adjusted at Annual Rates)



Average Hourly Earnings in Manufacturing, Ontario (Seasonally Adjusted)





# Coincidental and Lagging Indicators

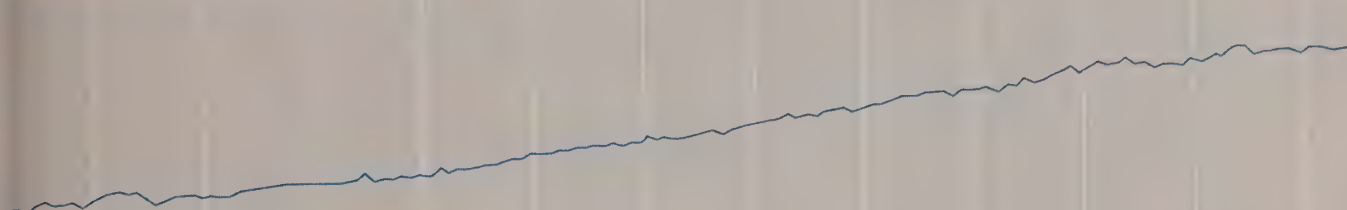
**Average Yield of 3-Month Treasury Bills, Canada** (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent  
Scale A  
\_8.0  
\_7.0  
\_6.0  
\_5.0  
\_4.0  
\_3.0  
\_2.0



**Employment, Ontario** (Seasonally Adjusted)

Million  
Scale L1  
\_3.25  
\_3.00  
\_2.75  
\_2.50  
\_2.25



**Unemployment Rate, Ontario** (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)

Per Cent  
Scale A  
\_2.0  
\_3.0  
\_4.0  
\_5.0  
\_6.0



**Index of Motor Vehicle Production, Canada** (1961 = 100, Seasonally Adjusted)

Index  
Scale L2  
\_400  
\_300  
\_200  
\_100  
\_70  
\_50



1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

	1970												1971											
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June										
Leading Indicators																								
Average Weekly Hours Worked in Manufacturing	39.9	40.6	39.5	40.0	39.6	39.5	39.4	40.1	39.2	38.8	39.1													
New Orders in Manufacturing Industries <sup>c</sup>	3,771	3,852	3,804	3,883	3,754	3,697	3,689	3,686	3,885	4,034	3,097	3,975	3,865											
Building Permits Issued in Ontario, Non-Residential Construction	109.3	156.6	81.6	93.8	120.3	103.1	100.0	90.6	97.0	117.5	112.0	77.1	73.3											
Urban Housing Starts (Annual Rate)	37,200	45,200	67,500	77,500	69,200	106,000	103,800	82,300	60,600	55,600	48,400	88,000	67,900	74,900										
Money Supply <sup>c</sup>	29,260	29,629	29,812	30,042	30,194	30,624	31,197	31,696	32,135	32,511	33,144	33,495	34,280											
T.S.E. Industrial Index <sup>u</sup>	154.21	151.53	157.36	160.28	165.8	162.1	168.7	174.4	178.1	177.4	185.3	181.6	177.8	180.7										
Business Failures <sup>u</sup>	65	77	73	48	55	71	74	71	71	70	100	81	88											
Business Failures — Liabilities <sup>u</sup>	3.4	8.1	3.1	2.8	5.3	8.1	5.8	7.7	11.6	4.5	5.2	3.8	3.4											
Coincidental and Lagging Indicators																								
Gross National Product <sup>c</sup> (Annual Rate)		83,824			84,988			86,376																
Average Hourly Earnings in Manufacturing	3.17	3.21	3.22	3.22	3.18	3.21	3.22	3.33	3.37	3.40	3.41													
3-Month Treasury Bill Rate <sup>u</sup>	6.34	5.94	5.70	5.51	5.39	5.01	4.40	4.44	4.68	4.06	3.16	3.00	3.03	3.05										
Cheques Cashed in Clearing Centres <sup>1</sup>	6,313	6,386	6,358	6,774	7,184	6,945	6,475	6,553	6,589	7,190	7,956	7,519												
Retail Trade	904	887	918	902	930	896	903	910	900	941	947	995												
Labour Force	3,174	3,162	3,121	3,129	3,145	3,166	3,167	3,151	3,215	3,223	3,197	3,207	3,232	3,231										
Employed	3,035	3,025	2,976	2,996	3,003	3,030	3,020	2,996	3,042	3,054	3,040	3,023	3,052	3,067										
Unemployed	137	134	142	142	158	147	156	162	173	169	157	184	180	164										
Unemployed as % of Labour Force	4.3	4.2	4.5	4.5	5.0	4.6	4.9	5.1	5.4	5.2	4.9	5.7	5.6	5.1										
Wages and Salaries	1,571	1,586	1,584	1,601	1,596	1,600	1,611	1,619	1,646															
Index of Industrial Employment	131.7	131.4	131.1	131.7	130.2	130.0	129.7	132.0	131.5															
Index of Industrial Production <sup>c</sup>	170.5	170.2	170.0	171.0	169.1	168.6	171.5	170.5	171.7	172.9	172.5	171.2												
Total Manufacturing <sup>c</sup>	167.5	167.4	165.4	166.5	163.1	164.3	165.5	165.1	167.1	169.0	168.3	167.5												
Non-Durables <sup>c</sup>	155.0	152.4	152.8	151.8	152.2	152.0	155.3	152.9	152.7	150.3	150.5	150.1												
Durables <sup>c</sup>	182.8	185.8	181.7	184.4	176.4	179.9	178.4	180.6	185.3	192.7	190.9	189.4												
Mining <sup>c</sup>	166.6	170.8	173.4	174.6	178.2	175.4	186.7	180.9	177.4	176.0	176.6	174.4												
Electric Power and Gas Utilities <sup>c</sup>	203.7	205.1	206.1	205.9	208.4	195.0	194.8	201.0	203.2	201.9	202.2	198.5												
Primary Energy Demand (Annual Rate)	61.60	63.35	65.03	65.68	66.80	65.56	64.32	66.79	67.62	67.76	68.14	67.21	65.74											
Exports (including re-exports) <sup>c</sup>	1,434.1	1,392.2	1,422.7	1,321.1	1,391.3	1,416.0	1,479.8	1,312.0	1,440.0	1,391.0	1,503.0	1,394.5	1,463.3	1,546.0										
Imports <sup>c</sup>	1,207.1	1,182.5	1,187.5	1,162.3	1,184.5	1,006.0	1,138.0	1,020.0	1,128.0	1,182.0	1,339.0	1,181.2	1,279.9	1,332.0										
Unclassified Indicators																								
Foreign Exchange Reserves <sup>u</sup>	3,406	3,650	3,689	3,848	3,785	3,831	3,871	3,813	3,816	3,868	3,944	3,962	3,998											
Industrial Materials Price Index <sup>u</sup>	273.7	271.5	270.3	268.5	269.2	267.4	266.4	264.2	264.2	266.0	266.4	267.6												
Consumer Price Index <sup>u</sup>	129.6	129.9	130.5	130.5	130.2	130.3	130.3	129.8	130.3	130.9	131.3	132.2	132.7	133.0										

<sup>c</sup>Statistics for Canada.

<sup>u</sup>Not seasonally adjusted.

<sup>1</sup>Ontario less Toronto.











# Ontario Economic Review

September/October 1971  
Volume 9, Number 5

Department of Treasury and Economics

Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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## The Ontario Economy

## Ontario Economic Accounts: A Dual Approach to the Measurement of Provincial Production Selected Economic Indicators

Patricia S. Fromstein, *Economist*  
Department of Treasury and Economics

A publication of the  
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and Economics  
Government of Ontario

Hon. W. Darcy McKeough  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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### About the Review

The feature article for the September/October edition of the *Ontario Economic Review* presents a detailed description of the methodological problems that arise in the development of a conceptual framework for the presentation of national account type data at the sub-national level. To provide a comprehensive picture of the provincial economy two complementary approaches have been adopted for the Ontario Economic Accounts. This paper describes a system of provincial economic accounts based on the "domestic" concept and compares it with the "national" set published in the November/December 1970 issue of this review.

The first section of this study outlines the conceptual framework underlying the "domestic" accounts, while the second part describes the estimation procedures employed. The last section discusses the sectoral accounts and their structural relationships in comparison with the set of accounts based on the "national" concept. The appendix contains annual estimates of the major components of Ontario income and expenditure for the years 1947 to 1969. Development of the "domestic" accounts now allows research workers to select the aggregate measure most appropriate to their particular analytical needs.

This article was prepared by Patricia S. Fromstein, Chief of the Provincial and Regional Accounts Section, Economic Analysis Branch, Department of Treasury and Economics.

### Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *This applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## TAX CONTINGENCY PLAN REVEALED

order to support Employment in Canada mitigating the disruptive effect on Canadian industry of the imposition of United States import surtaxes, federal Industry, Trade and Commerce Minister Jean-Luc Pepin has proposed to Parliament an allocation of \$80 million to counter the recent U.S. actions. A board to administer the fund is to be appointed under the special bill with an additional \$300,000 allocated to pay the administrative costs.

The \$80 million program would be available to firms that exported at least 20 per cent of their 1970 production to the United States. The proposal is designed to save industrial jobs with subsidies that would offset two-thirds of the ten per cent U.S. import surcharge.

Federal Finance Minister E. J. Benson told the commons that the subsidy plan was first step to offset the immediate problem caused by the surcharge but declined to outline the other measures under study.

The federal government's first long-term analysis of the effects of the surcharge indicates that if it is in effect for three months, the direct loss of export sales at annual rates would well approach \$400 million; if for six months, the loss could be \$700 million; and for one year, possibly \$900 million. The resulting loss of jobs might approximate 100,000, 70,000 and 90,000 respectively. These projections are based on an examination of 1,300 firms and further predict that about 150 companies would face financial difficulties within a year and that between 15 and 20 other firms would move to the United States.

The legislation emphasizes that the grants are to be used to maintain as near full employment as possible, rather than to cover losses that firms might incur because the surcharge raised the price of their goods in the United States.

The bill, entitled the Employment Support Act, outlines how the \$80 million will be administered and the criteria under which allocations will be made. Within the general guidelines set out by Mr. Pepin companies applying for assistance will have to meet the following three criteria:

Proof must be given that the U.S. surcharge has caused or is likely to cause significant layoffs at the plant;

It must be shown that at least 20 per cent of the plant's production during 1970 con-

sisted of imports now subject to the surcharge;

- Evidence must be given that the company is attempting to maintain production and employment at the plant "at a satisfactory level".

The legislation creates an Employment Support Board with a budget of \$300,000 to administer the fund. The board's seven members are to be named by the Cabinet. Under the bill, three of these members, including the board's chairman, must be from outside the government. The act does not set a maximum amount for individual grants, but makes it clear that the board must be satisfied the size of the grant is not in excess of what the applicant needs to maintain a satisfactory employment level.

As a safeguard, the board is also authorized to define assistance periods for each individual applicant. These periods will be the board's evaluation of the time a specific grant should cover. Although industries will be assured or refused a grant at the time of application, the actual grant will be made only at the end of the assistance period. Mr. Pepin also stated that generally speaking, government policy would limit the size of grants to two-thirds of the amount of the surtax as it affects individual plants. Moreover, grants would be calculated on a three-month period retroactive to August 16th, the date following President Nixon's announcement of the surtax.

The specific \$80 million program is set to expire at the end of the current fiscal year, March 31, 1972, although it is to be extended if the surcharge is still in effect. While the legislation would be put aside when the surtax ended it provides for enabling legislation that might be used again under similar circumstances. Thus the act does not refer directly to the United States but to the "imposition of foreign import surtaxes".

Commenting on Ottawa's proposed Employment Support Act, Ontario Premier William Davis said his government welcomed the bill and appealed to everyone concerned to support the federal government measure to ensure that it is "administered with a minimum of delay and red tape".

Premier Davis said that the act looks sound and workable at first glance, but added that he is preparing to take independent action if the federal measure proves to be inadequate. "It seems possible that some companies that need and deserve assistance may not be able to qualify for it under the

federal legislation, flexible though it is." The Premier went on to state that his government is prepared to provide assistance — "perhaps in the form of low interest loans — for Ontario companies that are harmed by the surcharge but not eligible for federal help".

Following the announcement of the federal government's measure aimed at counteracting the impact of the U.S. ten per cent import surcharge it was learned that the U.S. government was considering imposing countervailing duties to nullify the effect of the \$80 million Employment Support Act.

Canadian firms that are assisted by the federal government's legislative action to provide subsidies to enable the companies to make sales in the U.S. could be charged with "dumping" in the American market. It would be within the power of the U.S. administration to impose additional duties against the products of the subsidy-assisted Canadian firms. This would nullify the effects of the special legislation. The federal government, however, insists that its program should not be construed as a retaliatory measure against the American surcharge and maintains that its only aim is to ensure a satisfactory level of employment in Canada. Nevertheless U.S. authorities are studying the Canadian Bill to see whether it would undercut the U.S. program to restrain imports.

When asked if the U.S. government would take action against Canada if it determined the legislation was subsidizing firms to permit cheap imports into the U.S. the Under-Secretary of the Treasury for Monetary Affairs indicated that the U.S. administration would have no alternative but to take action.

At the subsequent annual joint meeting of the International Monetary Fund and the World Bank, United States Secretary of the Treasury John Connally announced that the U.S. was willing to remove the ten per cent import surcharge within a matter of weeks in return for tangible progress toward the dismantling of specific trade barriers and an honest floating of exchange rates.

In a definite softening of the formerly rigid U.S. position, Mr. Connally said free market forces should be utilized in the process of determining new levels for the world's major currencies. He indicated that if other governments would confirm their willingness to remove artificial impediments to freely floating rates and would go some way toward removing trade barriers within the coming



weeks, the United States would be prepared to cancel the ten per cent import surcharge.

While Mr. Connally did not specifically itemize the trade matters on which immediate progress is sought over the coming weeks, it is likely that the U.S. government has assembled "bills of particulars" for each of its major trading partners. These specific barriers will probably be made known in the private government-to-government negotiations expected to get underway very shortly.

In the bilateral discussions with Canada the U.S. will almost certainly call for an end to the present Canada-U.S. Automotive Agreement signed in 1965. At the time the new U.S. economic measures were brought down the two governments were in the midst of discussions for the purpose of improving the auto agreement from the point of view of both countries. Following President Nixon's announcements on August 15, the talks were broken off. The Canadian federal government has indicated its interest in resuming discussions but has stated that the auto pact is not negotiable as part of the conditions for removal of the surcharge.

The auto pact was designed to achieve a greater Canadian input into automotive production and create one North American market for automotive products. In complying with the commitments to step up Canadian production, U.S. car makers chose to produce in Canada a large share of their total North American output of compact models. Compacts have subsequently become the fastest selling models in both the U.S. and Canada and the result has been an unexpected increase in car exports from Canada to the United States. Moreover, in contrast to projections of more rapid increases in Canadian than American demand in the latter 1960's, automotive sales have grown faster in the U.S. than in Canada in recent years. Thus shifts in both production and sales have occurred, with the result that U.S. imports from Canada have grown far more rapidly than expected at the time of the agreement. Consequently the U.S. claims that the transitional period of the auto agreement has expired and that there has been overachievement of Canadian value-added in terms of the original agreement.

The United States ran a balance of trade surplus with Canada until 1967, but the balance then turned toward progressively larger deficits. About one-third of the present deficit (approaching a seasonally-adjusted rate of \$700 million in the first seven months

of 1971) is accounted for by increasing Canadian sales of automobiles and parts. The U.S. is extremely anxious to make removal of the import surcharge conditional on removal of the transitional safeguards in the 1965 auto pact since the huge trade in autos and parts is a separate agreement and therefore exempt from the recent surcharge. In fact, without renegotiation of the auto pact the overall decline in manufactured export sales to the U.S. will probably be offset by a significant improvement in Canadian exports of autos and parts since Canadian production should benefit from the removal of the seven per cent U.S. excise tax and the imposition of the U.S. import surcharge on non-North American produced cars. Looking ahead to 1972 on the assumption that total U.S. demand will be stronger than in 1971 as a result of the new economic policies, it is reasonable to assume that exports of all non-affected products from Canada to the U.S. will rise significantly. This would result in an even greater imbalance in the trade in motor vehicles and parts between Canada and the U.S. and from the United States point of view accentuates the desirability of renegotiating the auto agreement.

The ten per cent "temporary" surcharge on dutiable imports will affect approximately \$2.5 billion of Canada's present exports to the U.S. markets. This represents less than one quarter of our present exports to that country since the U.S. program exempts unprocessed raw materials, goods which enter under quotas such as Canadian oil and all processed or manufactured exports which are duty-free. This includes the trade in autos and parts, farm machinery and fertilizers, all of which have, since the end of the war, come under various types of free trade agreements with the U.S. The main burden of the surcharge will fall upon \$1.5 billion of Canada's exports of highly manufactured goods — products which already have been seriously affected by the appreciated Canadian dollar. This group includes industrial machinery, electrical products, textiles and clothing, chemicals, furniture and appliances and numerous consumer and industrial products. Ontario, with its heavy concentration of manufacturing, machinery and metal products industries will likely be most affected by the U.S. import duty. Manufacturers sending their products into the U.S. markets have already been handicapped by a six per cent appreciation of the Canadian dollar since June of 1970. The addition of a ten

per cent surcharge and the ten per cent investment tax credit (granted only for purchase of U.S. made capital goods) will deal a double blow to our growing machine exports.

## **DESIGN FOR DECISION-MAKING**

The eighth annual review of the Economic Council of Canada strongly urges all participants involved in government decision-making to adopt a courageous and futuristic attitude toward improving this increasingly important function. The processes by which this objective can be achieved forms the central theme of the review.

The expanded role of government decision-making can be seen in the light of government expenditure. Total government expenditure is following a marked upward trend — it rose from 31.5 per cent of G.D.P. in 1961 to 35.5 per cent in 1970 — while at the same time there have been considerable changes in its composition and distribution. Government expenditure has progressively outgrown its traditional function of financing its regulatory departments and is now heavily involved in economic, financial and commercial activities. It is with particular regard to these activities that the Council stresses the essential need for improved decision-making at all levels of government.

## **New Approaches**

The Council confirms that to date there is little reliable information on where social problems are or where it has been and that this highly unsatisfactory state of affairs if continuing for the future is to be carried out in similar circumstances. While economic statistics are valuable in monitoring the material well-being of the country, they are inadequate indicators for assessing social well-being.

What is required are social statistical indicators which, within defined limits, provide some measure of human well-being. However, as the review points out there has been no major development of this kind in Canada. This is the challenge which the Council puts out to the analyst — the creation of a meaningful index of social welfare.

Ideally this index would reflect current and temporary needs and could be used as a basis for a more realistic view of the future, thereby allowing preventative measures to be made now rather than having to pay the heavy cost of ill-judged decisions at a later date. In this way, the Council is urging analysts to chart possible futures, so



decision-maker can decide on a more systematic framework of national goals.

In examining the systems analysis approach which looks at the decision-making process as a whole and also in terms of the interrelationships of its parts, the Council finds that this type of analysis is too limited. The real world of decision-making is far too complex to fit within a systems framework. The fear is also present that the systems analysis approach could to some degree stifle creativity in the decision-making process.

Policy science is looked upon by the Council as a significantly flexible approach to encompass the political reality which plays a major role in decision-making. It is also considered to encourage a greater degree of imagination in looking for processes which could improve policy-making.

### Systematic Analysis

The review recognizes that the essential elements of systematic analysis are three-fold in nature. Firstly, objectives must be made explicit; secondly, the consequences of alternatives have to be weighed carefully; and thirdly, a systematic process for decision-making and review has to be set up. In looking at these fundamentals in present government decision-making, the Council finds that they have been most successfully applied in the field of budgetary systems. The best known example has been the adoption of the Planning, Programming, Budgeting System. Here significant advances toward systematic and explicit decision-making have taken place and this had led to the creation of an equally important climate for change. However, improvement in the government decision-making process demands comprehensive advances at provincial and municipal levels as well as at the central level. While unable to conduct a thorough examination of decision-making at all three levels the Council concludes from a series of interviews of elected and appointed officials that progress in this area has been rather uneven and marked by pockets of sophistication at all government levels.

The review states that systematic analysis must not be regarded as a technique to provide simple answers to decision-makers' questions, but rather it can provide useful information to aid in the examination of problems. Sample survey techniques and wider use of computers can help decision-

makers understand social problems, but that understanding of policy analysis will not necessarily improve with the proliferation of these facilities.

Cost-benefit analysis can be a useful guide in choosing from alternatives, especially where benefits can be quantitatively evaluated. This type of analysis is not, however, particularly relevant to choosing among alternative benefits which are intangible in nature. Neither does this method take into account questions of a political or distributional kind which are inherent in evaluating alternative objectives for society. Simply increasing total expenditure on social services will not solve the problem. Inequities in social services can only be eradicated by decisions based on knowledge of distributional effects.

### A Framework for Government Decision-Making

Decision-making is defined by the Council as "essentially a process of choosing among alternatives" and that "it is essential to use the widest possible basis of relevant information and apply the best possible analytical techniques". Alternatives are chosen at three levels: objective or policy; policy or strategy; and programs or tactics.

Policy objectives must be continuously scrutinized to ensure that they do not depart from public sentiment, and the process must also contain a feedback mechanism so that objectives, policies and programs can be modified by experience. The Council notes the progress which has been achieved, particularly at the tactical level, but points out that more attention is required at the "higher levels" and also emphasizes the need for "a more systematic approach to the whole decision-making process".

Better information and more refined techniques will help improve judgement but what is really required is an improved method of examining the choices to be made and this can only come about as a result of "a continuous, conscious and deliberate weighing of alternative actions on the broadest possible basis of knowledge and participation". The bases on which government decisions are made will have to be made available to the public, if decision-makers wish to capture the imagination of the public and obtain "feedback".

Since many of a country's aspirations are abstract in nature and cannot be classified

into explicit objectives, the Council "strongly recommends the development of a comprehensive set of statistical measures to monitor the changing conditions of our society over a broad spectrum of concerns".

These measures, termed "goal indicators", should be designed to show aggregate changes and distributional effects of specific goal areas over time. They are accordingly classified into two types, "goal output indicators", and "goal distribution indicators". The Council believes that these two types of indicators offer significant possibilities for sharpening perceptions of society's needs, and that this concept can assist all levels of government in better identifying policy objectives.

Decision-making will also be greatly improved by wider distribution of knowledge and information among all participants in the decision process. The review is especially critical of the extent to which this process of broadening and encouraging involvement in public policy is taking place. It concludes that "by and large, the general public does not know, even after the fact, the arguments and evaluations on which public decisions are based".

### Conclusions and Recommendations

The review concludes that the "open, responsive, and systematic" examination of public policy is fundamental to the improvement of government decision-making at all levels. In order to encourage "wider and more pertinent discussion of goals, priorities, objectives and effectiveness of government policies" the Council recommends that:

- "Expert private groups and individuals participate in the difficult conceptual work required for the development of meaningful indicators;
- "Universities include more courses on the principles, processes and structures of government decision-making in their curricula;
- "An independent research institute concerned with the analysis of public policy issues be established;
- "Governments regularly publish and make widely available documents discussing current public policy issues and alternatives;
- "Governments proceed as quickly as is prudently possible to clarify the rights (and limitations) of the public to access to government information".



# Ontario Economic Accounts: A Dual Approach to the Measurement of Provincial Production

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Department of Treasury and Economics

Since 1969, the Economic Analysis Branch of the Department of Treasury and Economics has been engaged in a continuing research program to develop time series of the components of Ontario's gross output comparable to information available at the national level in the Canadian System of National Accounts. Estimates generated in the course of this project provide a valuable tool for quantitative economic analysis and form the indispensable data base for the development of econometric models of the Ontario economy.

The development of provincial economic accounts requires examination of a number of conceptual problems arising only at the sub-national level. Within the framework of an economic accounting system at provincial level, the development of an appropriate residence criterion for corporate business enterprises is of central significance since two basically different definitions of corporate residency must be considered.

One approach preserves the functional unity of corporations by using a "national" residence criterion, with the effect that a Canadian corporation operating in more than one province will have all of its establishments classified as residents of one province only. A number of appropriate bases of classification for this definitional treatment can be developed including head office location, place of incorporation or address for filing federal tax returns. A second approach advocated in the literature on regional economic accounting can best be described as "domestic" and allocates income and output of multi-provincial corporations among all those provinces in which permanent establishments are maintained. Each approach has ramifications for the statistical treatment of a number of items other than corporate income — notably, business investment and foreign and interprovincial trade.

Both approaches have advantages and disadvantages for particular analytic applications. In general, the "national" concept provides a more appropriate basis for examining interprovincial economic relations, while the "domestic" approach focuses on economic activity strictly within the geographic boundaries of the province.

The first set of Provincial Accounts developed by the Economic Analysis Branch was based on the "national" concept.<sup>1</sup> In order to supplement the information available in these Accounts and to provide a com-

prehensive picture of the Ontario economy, the Branch initiated work on a second set of income and expenditure estimates based on the "domestic" concept. Development of the "domestic" accounts allows research workers to select the aggregate measure most appropriate to their particular analytical needs.

This article presents a detailed description of the development of the Ontario Economic Accounts on a "domestic" basis and compares them with the "national" set. The first section of this study outlines the conceptual framework underlying the "domestic" accounts, while the second part describes the estimation procedures employed. The last section discusses the sectoral accounts and their structural relationships in comparison with the first set of accounts based on the "national" concept. The appendix contains annual estimates of the major components of Ontario income and expenditure for the years 1947 to 1969.

## THE CONCEPTUAL FRAMEWORK

As in the development of the "national" Ontario Accounts, the components of provincial output were estimated by decomposition of data from the Canadian National Accounts in order to provide a relatively long run of data with minimum time lag. As a result, the structural and conceptual framework of the Ontario Accounts is determined to a significant extent by the Canadian national accounting system and the Ontario "national" and "domestic" sets are quite similar in format.

Both sets of Ontario accounts identify six sectors: a personal sector; the various levels of government in Ontario; the business sector; the federal government; the rest of Canada; and the rest of the world. As was the case with the "national" set, it was felt that separate distinction of the three non-resident sectors was necessary to allow analysis of Ontario's economic status within the Canadian economy as well as the province's position in regard to federal-provincial transactions.

Most sectors are defined in exactly the same manner for both the "national" and "domestic" sets of accounts. Thus the personal sector comprises all private individuals and non-profit organizations resident in Ontario as determined by Statistics Canada for its provincial allocation of personal income. In accordance with current Statistics Canada

practice, public hospitals are included in the sector prior to 1961. The Ontario government sector is composed of all provincial and local government departments and agencies and public hospitals from 1961 on. Government business enterprises are assigned to the business sector on the grounds that their behaviour responds to different motivations from other public operations.

The treatment of the federal government is identical in both versions of the Ontario Accounts. Essentially, the federal government is defined as non-resident in Ontario and only those transactions between the federal government and the various Ontario sectors are recorded. All relations between the federal government and other non-residents of Ontario are considered outside the scope of Provincial Accounts.

The major point of departure between "national" and "domestic" versions of provincial economic accounts stems from their different definitions of the Ontario business sector. Both include all unincorporated business located within the Province but the conceptual treatment of corporate business varies. The accounts on a "national" basis treat multi-regional corporations as single entities and ascribe their total operations to residence in one province only on the basis of the address of the District Taxation Office with which it files federal tax returns. Thus all establishments of corporations submitting returns to District Taxation Offices in Ontario are defined as belonging to the Ontario corporate sector, regardless of where the production units are actually located. This approach preserves the functional unity of corporations and favors analysis of the nature of corporate decision-making which generally takes place at the head office level for the enterprise as a whole. For certain industries, especially in the field of transportation, this treatment is more appropriate than a provincial allocation on a geographic basis. For example, it is difficult to conceive of the distribution of a trans-national railway into operating units. The "national" concept has the advantage of allowing a more meaningful distribution of some intersectoral transfers.

However, there are certain analytic problems for which provincial data based on a geographically-determined criterion of residence are more valuable. For some purposes "national" measures of provincial income and expenditure may be considered

<sup>1</sup>M. V. Chari and R. H. Frank, "The Development of Ontario Economic Accounts", Ontario Economic Review, Vol. 8, No. 6 (Nov./Dec. 1970), pp. 5-17.



heavily weighted toward a province with a high concentration of corporate head offices. Research into the impact of provincial government policy especially may require measures of economic activity which conform exactly to the geographic confines which that government can affect most easily and directly.

Designed as an alternative to the "national" basis, the "domestic" set of accounts attributes corporations to each province in which they maintain a permanent establishment according to the allocation formula used by the federal government for tax-reporting purposes. This approach is more compatible than the "national" with certain reporting information such as the geography-oriented public and private investment surveys published by Statistics Canada and in its intentions of expanding the collection of establishment-based data series. The "domestic" concept is more closely linked to the Ontario I/O Table and also has the advantage of allowing simplification of certain assumptions in regard to intersectoral transactions such as interprovincial wage payments by corporations.

The individual components of both sets of Ontario Accounts are essentially similar to those appearing in the Canadian National Accounts, but certain conceptual modifications appropriate to the provincial level have been introduced. One important difference between the Canadian and Ontario Accounts results from the definition of the federal government and residents of other provinces as non-residents for Ontario. Ontario's exports and imports for provincial accounting purposes must accommodate a number of inter-provincial and interprovincial factor payments which can be considered as wholly national transactions at the national level.

Generally, the "domestic" approach requires fewer changes from the Statistics Canada conceptual treatment. In contrast to the "national" set, there is no need to attempt estimation of interprovincial wage payments from business when the "domestic" approach is adopted because of the geographically-based definition of the Ontario business sector. It can safely be assumed that flows of labour resident in one province but employed by business located in another are of insignificant magnitude. However, the "domestic" approach still requires an adjustment for wage payments received from the federal government. These wages and salaries

paid by the federal government to Ontario residents must be included in the total of Ontario exports to non-residents.

As in the "national" set of Ontario Accounts, a departure is made from the Statistics Canada treatment of interest on the public debt. The Canadian system defines that portion of interest on the public debt which is paid to non-residents as a factor income on the grounds that it is not merely a transfer of money but represents a potential claim on domestically-produced output. Thus, at the national level these payments are recorded as part of the income of non-residents and are included in the total of Canadian imports.

In the Provincial Economic Accounts, all payments of interest on the public debt, whether paid to residents or non-residents, are treated as transfer payments. Interest paid by the Ontario government sector cannot be considered as conferring a claim on output produced solely in Ontario. Similarly, interest on the public debt received by Ontario residents from the federal government or from governments of the other provinces is not regarded as an addition to provincial product. As transfer payments, these items do not enter into any calculation of Ontario's exports and imports of goods and services.

The "domestic" Ontario Accounts depart from the "national" version in their treatment of capital formation and inventory investment. While the "national" set of accounts records these items on an ownership basis regardless of where the corresponding goods are actually located, the "domestic" approach with its geographically-based definition of the business sector considers only those assets physically situated within the province. This method conforms to the Statistics Canada national accounting treatment which defines investment on a domestic basis.

### ESTIMATION PROCEDURES

Both the "domestic" and "national" versions of the Ontario Economic Accounts follow Statistics Canada practice and estimate gross product using two approaches — one involving an aggregation of incomes received while the second measures total expenditures. The income approach sums a number of factor income receipts plus an inventory valuation adjustment to arrive at net provincial income at factor cost, which when adjusted for indirect taxes, subsidies, capital consumption allowances and miscellaneous valuation ad-

justments totals gross product at market prices. The expenditure approach aggregates all purchases by residents, the value of inventory investment and Ontario's trade balance to arrive at a gross expenditure total. In order to equalize these two measures, the statistical discrepancy between them is recorded as a "residual" error.

The Ontario Sector Accounts were developed by allocating each transaction appearing in the Canadian National Accounts into Ontario and non-Ontario portions. For classification purposes, all National Accounts transactions can be distributed into one of three distinct groups: transactions between two sectors; transactions between units of the same sector; and accrual items.

Intersectoral transactions at the national level can generally be regarded from either the recipient or the disbursing unit's point of view for purposes of provincial distribution. This implies that any intersectoral transaction can be disaggregated into four distinct components. Payments made by any Ontario sector can be distributed among Ontario and non-Ontario residents, while payments of any non-Ontario sector can be similarly treated as regards allocation among recipients.

As in the development of the "national" set of accounts, a two-way classification scheme was generally adopted in allocating all intersectoral transactions available at the national level. For certain items such as personal income and its main components, provincial distributions were available in the National Accounts. However, for others the provincial allocation had to be estimated on the basis of supplementary information generally available in published sources.

Once the marginal totals were established, the secondary distributions were made in accordance with auxiliary information consistent with the "domestic" concept. However, the establishment-based definition of corporate residence allowed certain simplifying assumptions to be made, thus reducing the number of items for which a complete four-way allocation had to be made. For example wages, salaries and supplementary labour income received from business by Ontario persons can now be assumed to be wholly generated *within* and *by* Ontario.

Transactions within a single national sector presented a special problem in the development of provincial accounts since almost all intra-sectoral transfers are as-



sumed to cancel each other at the aggregate national level and are not shown explicitly in the National Accounts. In both versions of the Ontario Economic Accounts, all intra-governmental transfers among the provincial and municipal governments (and hospitals from 1961 on) could be ignored in the consolidated account of the Ontario Government Sector. However, transfers received from the federal government had to be explicitly included in the revenue of the Ontario governments.

Due to lack of data on interprovincial trade, no complete estimate of intra-business purchases and sales of goods and services could be made on either the "national" or the "domestic" concept. While the "national" version tries to overcome this problem by identifying the value of trade in consumer and capital goods, the "domestic" set of accounts relegates the net intra-business trade balance to the residual. It is hoped that the future development of statistical series on interprovincial shipments of goods and services collected on an establishment basis will allow estimation of the complete trade universe compatible with the "domestic" concept.

Accrual components, which are transactions in an accounting sense only and do not represent payments between sectors or even between units within one sector, were treated in essentially the same manner as in the "national" set of Provincial Accounts. However, modifications were required to ensure that the data generated were logically compatible with the establishment-based definition of corporate residence. For example, in the "domestic" version, the Ontario corporate profit item attempts to measure all profit earned in Ontario with no attempt made to preserve the unity of any given corporation. The "domestic" distribution is based on information collected by the Department of National Revenue in conjunction with the processing of corporate tax returns.

Capital formation, inventory investment and capital consumption are also allocated on the "domestic" concept with location of physical assets as the determining criterion. Thus, estimates contained in the Ontario Economic Accounts on a "domestic" basis are compatible with the provincial distribution of private investment provided by Statistics Canada.

## **THE SECTOR ACCOUNTS**

As in the "national" set, the various inter-

sectoral and other components are grouped to form eight basic accounts for the province. A double-entry bookkeeping system ensures that total revenue (or receipts) is balanced with total expenditure (or payments) for each account.

The "domestic" sector accounts for Ontario conform more closely to the original rather than the revised presentation of the national accounts. The unrevised format was chosen as most susceptible to provincial allocation because of a number of conceptual and statistical limitations which arise in dealing with the detailed financial flows and the separate current and capital accounts of the revised format at the sub-national level.

### **Current Account: Personal Sector**

The credit side of this account gathers all incomes received by or accrued to all individuals and unincorporated businesses classified as resident in Ontario. The main components of personal income are defined in exactly the same terms as those in the National Accounts, although development of the Provincial Accounts necessitated a finer sectoral breakdown than is shown at the national level. The "national" and "domestic" versions of the personal account do not differ in aggregate terms, but the intersectoral allocation varies slightly.

As in the "national" Provincial Accounts, wages, salaries and supplementary labour income are allocated to Ontario and non-Ontario sources. However, the "domestic" approach assumes that business establishments located in any particular province employ residents of that province only and, therefore, all wage payments received by Ontario persons from business are treated as originating within the province. Intra-personal wage payments between Ontario and other provinces are also likely to be insignificant, as are factor income payments to Ontario persons from rest of Canada governments. These provincial and municipal governments with jurisdiction in other provinces are assumed to operate wholly outside of Ontario and to employ no residents of this province.

Both the "national" and "domestic" Ontario Accounts attempt no further sectoral distribution of net income of non-farm unincorporated business including rent and net income of farm operators from farm production on the assumption that they are generated solely within the province. The sources of interest, dividends and miscellaneous in-

vestment income of persons are analyzed as part of the Investment Income Appropriation Account.

The expenditure items of the Personal Account are balanced against total personal income by means of the personal savings component. Aggregate expenditure and savings are identical in both sets of Ontario Economic Accounts. Once again all items are broken down into payments to resident and non-resident sectors. However, in the "domestic" version, all purchases of consumer goods are assumed to be made from business establishments located in Ontario and therefore defined as belonging to the Ontario business sector. No account is taken of direct interprovincial purchases from business such as would be made by Ontario travellers in the rest of Canada. This approach precludes any identification of interprovincial trade in consumer goods from the viewpoint of the purchasing unit. Similarly, all transfers of interest on the consumer debt are assumed to remain within the province.

### **Current Account: Government Sector**

All current revenues and expenditures of Ontario provincial and local governments together with public hospitals from 1961 are combined in this account. As in the case of the personal account, the aggregates on the credit and debit sides are the same in both the "national" and "domestic" versions, although a slightly different intersectoral distribution for certain items. In the Ontario Accounts, estimated on a "domestic" basis, both direct and indirect taxes paid by business are defined as collected only from the Ontario business sector; these components are given similar treatment to taxes and current transfers to government from persons.

Transfers received by the Ontario government sector from the federal government are explicitly shown as revenue. However, transfers between the various levels of government in the Ontario sphere cancel out in the consolidation process.

Government purchases of goods and services from persons and business are calculated net of government sales to these sectors. All sales to government by business are assumed to involve only Ontario residents. Similarly, subsidies to business are taken as paid to establishments operating within the geographical confines of the province. The interest on the public debt, however, is distributed among both resident and non-resident residents.



The balancing item is the surplus or deficit in Current Account for all levels of government in Ontario taken together. The value of this item differs from the overall government surplus or deficit by the amount of government capital formation.

#### **Operating Account: Business Sector**

In this account the output of the Ontario business sector measured by revenue from sales of goods and services and the change in business inventories is balanced against the costs which determine the value of goods and services produced. Business activity as determined by total operating revenue and expenditure in the "domestic" set of Ontario accounts differs from the aggregate of the "national" version because of the geographically-based definition of the business sector adopted here. While the units comprising the incorporated portion of Ontario business are identical in both sets, the "domestic" corporate sector, unlike the "national", is composed of those establishments operating in Ontario with no attempt made to treat any foreign corporation as a single entity.

As in the "national" Provincial Accounts, where data limitations prevented any sophisticated estimation of intra-business interprovincial trade in goods and services. Whereas in the "national" set an attempt was made to isolate certain interprovincial trade components by means of consumer purchases and

business trade in capital equipment, this project preferred to submerge all intra-business interprovincial sales and purchases in the residual error of the estimate until such time as a more complete estimate of trade between Ontario and the rest of Canada can be made.

#### **Investment Income Appropriation Account**

In both versions of the Provincial Accounts, this account serves to collect all investment income components and trace their disposition to the various sectors. The different definition of the corporate sector adopted in the "domestic" set affects not only the total of investment income but also the intersectoral distribution of the various items enumerated. One component which disappears completely is corporate retained profits accrued other than in the province of residence since the conceptual basis of the "domestic" accounts limits the corporate sector of any province to operations within that province.

#### **Provincial Saving and Investment Account**

This account aggregates the savings generated by all Ontario residents and distributes them between capital formation by the various sectors of the provincial economy and the net balances on account with non-residents. The two versions of the Saving and Investment Account differ in both the value of particular components and their inter-

sectoral distribution. The main differences have been outlined in the discussion of the four preceding accounts.

#### **Non-resident Sector Accounts**

Separate accounts for the federal government, the rest of Canada and the rest of the world can readily be generated from the other sector accounts.

#### **CONCLUSION**

In developing time series of income and expenditure at sub-national level, the problem of how to allocate the operations of multi-regional corporations becomes a major conceptual issue. Basically, a decision must be made either to treat each corporation as a single unit allocating all of its operations to one region or to distribute its activities among all regions in which the corporation maintains establishments.

Each approach has advantages which make it most appropriate for the analysis of particular economic problems. In view of the multiplicity of analytic applications for which income and expenditure data are required, the Economic Analysis Branch has developed a "domestic" set of Provincial Accounts supplementing the "national" version published earlier. The "domestic" series now allow researchers an added measure of flexibility in choosing data most suitable to their analytic requirements.

Table I — Provincial Income and Gross Provincial Product, 1947-1956

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
	\$ millions									
1. Wages, salaries and supplementary labour income	2,654	3,099	3,340	3,616	4,259	4,771	5,154	5,268	5,696	6,421
2. Military pay and allowances	32	31	39	46	77	105	117	134	139	149
3. Corporate profits before taxes	756	810	810	1,096	1,236	1,207	1,212	1,071	1,391	1,608
4. <i>Deduct:</i> Dividends paid to non-residents	-152	-156	-192	-264	-246	-236	-232	-225	-251	-295
5. Interest and miscellaneous investment income	97	110	94	163	190	180	191	198	250	267
6. Accrued net income of farm operators from farm production	264	349	336	356	433	360	319	277	244	240
7. Net income of non-farm unincorporated business including rent	523	569	625	634	662	697	837	885	986	977
8. Inventory valuation adjustment	-229	-199	-32	-150	-264	48	4	35	-76	-103
9. <i>Net Provincial Income at Factor Cost</i>	3,945	4,613	5,020	5,497	6,347	7,132	7,602	7,643	8,379	9,264
10. Indirect taxes less subsidies	715	736	765	840	1,016	1,093	1,180	1,186	1,287	1,465
11. Capital consumption allowances and miscellaneous valuation adjustments	482	556	638	726	850	901	1,009	1,183	1,310	1,457
12. Residual error of estimate	+189	+161	+142	+151	+26	-173	-99	-277	-410	-259
13. <i>Gross Provincial Product at Market Prices</i>	5,331	6,066	6,565	7,214	8,239	8,953	9,692	9,735	10,566	11,927



Table I — Provincial Income and Gross Provincial Product, 1957-1969 (cont'd)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Wages, salaries and supplementary labour income	7,027	7,260	7,747	8,126	8,437	9,057	9,716	10,616	11,875	13,428	14,755	16,193	18,216
2. Military pay and allowances	165	172	170	172	189	201	206	208	205	229	250	256	291
3. Corporate profits before taxes	1,493	1,524	1,799	1,689	1,759	1,970	2,257	2,634	2,906	3,064	3,009	3,301	3,545
4. <i>Deduct:</i> Dividends paid to non-residents	-302	-298	-325	-309	-354	-381	-431	-495	-547	-587	-603	-611	-620
5. Interest and miscellaneous investment income	373	392	373	418	457	552	604	613	687	810	899	1,029	1,186
6. Accrued net income of farm operators from farm production	272	330	257	268	285	310	284	270	308	407	336	367	450
7. Net income of non-farm unincorporated business including rent	1,049	1,102	1,133	1,094	1,116	1,098	1,227	1,267	1,359	1,446	1,566	1,683	1,751
8. Inventory valuation adjustment	-25	-18	-47	-6	-19	-47	-94	-54	-139	-140	-139	-135	-247
9. <i>Net Provincial Income at Factor Cost</i>	10,052	10,464	11,107	11,452	11,870	12,760	13,769	15,059	16,654	18,657	20,073	22,083	24,572
10. Indirect taxes less subsidies	1,534	1,561	1,706	1,770	1,900	2,154	2,285	2,532	2,999	3,249	3,557	3,891	4,308
11. Capital consumption allowances and miscellaneous valuation adjustments	1,628	1,620	1,759	1,827	1,833	1,985	2,122	2,299	2,496	2,709	2,947	3,104	3,343
12. Residual error of estimate	-140	-425	-645	-621	-423	-793	-529	-552	-638	-335	-520	-561	-525
13. <i>Gross Provincial Product at Market Prices</i>	13,074	13,220	13,927	14,428	15,180	16,106	17,647	19,338	21,511	24,280	26,057	28,517	31,698





Table II — Gross Provincial Expenditure, 1957-1969 (cont'd)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Personal expenditure on consumer goods and services	8,154	8,732	9,147	9,478	9,655	10,320	11,062	11,758	12,898	14,216	15,447	16,633	18,111
2. Government expenditure on goods and services:													
3. Current expenditure	1,235	1,351	1,456	1,543	1,936	2,191	2,466	2,523	2,804	3,383	3,631	4,039	4,469
4. Capital expenditure	772	871	956	1,057	1,453	1,575	1,779	1,883	2,002	2,449	2,734	3,136	3,557
5. Business gross fixed capital formation:	463	480	500	486	483	616	687	640	802	934	897	903	912
6. New residential and non-residential construction	2,679	2,561	2,343	2,317	2,219	2,346	2,524	3,054	3,519	4,233	4,374	4,576	5,247
7. New machinery and equipment	1,620	1,719	1,464	1,395	1,342	1,363	1,469	1,709	1,845	2,258	2,376	2,681	2,972
8. Value of physical change in inventories:	1,059	842	879	922	877	983	1,055	1,345	1,674	1,975	1,998	1,895	2,275
9. Non-farm business inventories	477	-114	56	91	397	-190	241	276	506	531	227	159	648
10. Farm inventories and grain in commercial channels	142	-80	200	24	249	104	276	205	558	444	165	200	297
11. Exports of goods and services abroad	335	-34	-144	67	148	-294	-35	71	-52	87	62	-41	351
12. Deduct: Imports of goods and services from abroad	3,064	3,032	3,250	3,414	3,671	3,999	4,496	5,232	5,657	6,587	7,243	8,507	9,318
13. Exports of labour services to federal government	-3,114	-3,239	-3,435	-3,538	-3,666	-3,943	-4,258	-4,663	-5,153	-5,769	-6,214	-6,835	-7,594
14. Deduct: Federal government investment income received from or accrued in Ontario	496	526	524	554	602	636	653	692	729	842	914	975	1,148
15. Dividends received from rest of Canada	-60	-61	-59	-56	-63	-69	-80	-98	-96	-92	-105	-118	-189
16. Deduct: Dividends paid to rest of Canada	98	100	100	110	107	146	161	169	199	232	247	254	263
17. Residual error of estimate	-96	-93	-101	-107	-102	-123	-148	-157	-190	-219	-227	-235	-248
18. Gross Provincial Expenditure at Market Prices	+141	+425	+646	+622	+424	+793	+530	+552	+638	+336	+520	+562	+525
	13,074	13,220	13,927	14,428	15,180	16,106	17,647	19,338	21,511	24,280	26,057	28,517	31,698

Table III — Relation Between Net Provincial Income at Factor Cost, Personal Income, Personal Disposable Income, and Personal Saving

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
	\$ millions									
1. Net Provincial Income at Factor Cost	3,945	4,613	5,020	5,497	6,347	7,132	7,602	7,643	8,379	9,264
2. <i>Add:</i> Transfer payments (excluding interest on the public debt and transfers from Ontario corporations)	278	277	291	306	321	448	479	543	559	571
3. <i>Add:</i> Interest on the public debt	230	229	242	218	240	277	248	266	275	297
4. <i>Add:</i> Interest on the consumer debt	5	8	10	13	13	17	23	28	33	40
5. <i>Deduct:</i> Earnings not paid out to persons	-376	-463	-573	-648	-693	-977	-947	-863	-1,028	-1,172
6. <i>Equals:</i> Personal Income	4,082	4,664	4,990	5,386	6,228	6,897	7,405	7,617	8,218	9,000
7. <i>Deduct:</i> Personal direct taxes	-411	-439	-421	-415	-588	-721	-802	-821	-858	-1,014
8. <i>Deduct:</i> Other current transfers to government	-11	-13	-15	-15	-17	-19	-19	-19	-23	-33
9. <i>Equals:</i> Personal Disposable Income	3,660	4,212	4,554	4,956	5,623	6,157	6,584	6,777	7,337	7,953
10. <i>Deduct:</i> Personal expenditure on consumer goods and services	-3,593	-4,080	-4,386	-4,743	-5,333	-5,814	-6,198	-6,383	-6,882	-7,429
11. <i>Deduct:</i> Transfers to corporations	-5	-8	-10	-13	-13	-17	-23	-28	-33	-40
12. <i>Deduct:</i> Transfers to rest of the world	-18	-13	-12	-14	-17	-20	-22	-26	-28	-31
13. <i>Equals:</i> Saving of persons and unincorporated business	44	111	146	186	260	306	341	340	394	453



Table III — Relation Between Net Provincial Income at Factor Cost, Personal Income, Personal Disposable Income, and Personal Saving (cont'd)

	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
	\$ millions												
1. Net Provincial Income at Factor Cost	10,052	10,464	11,107	11,452	11,870	12,760	13,769	15,059	16,654	18,657	20,073	22,083	24,572
2. <i>Add:</i> Transfer payments (excluding interest on the public debt and transfers from Ontario corporations)	672	834	968	1,066	889	939	1,004	1,070	1,160	1,291	1,646	1,929	2,209
3. <i>Add:</i> Interest on the public debt	280	303	384	405	436	473	501	553	598	653	695	754	843
4. <i>Add:</i> Interest on the consumer debt	47	52	63	73	74	79	82	88	103	117	126	139	161
5. <i>Deduct:</i> Earnings not paid out to persons	-1,141	-1,184	-1,409	-1,361	-1,373	-1,506	-1,677	-2,034	-2,162	-2,285	-2,225	-2,535	-2,681
6. <i>Equals:</i> Personal Income	9,910	10,469	11,113	11,635	11,896	12,745	13,679	14,736	16,353	18,433	20,315	22,370	25,104
7. <i>Deduct:</i> Personal direct taxes	-1,110	-1,020	-1,110	-1,266	-1,329	-1,418	-1,502	-1,736	-2,011	-2,579	-3,067	-3,668	-4,530
8. <i>Deduct:</i> Other current transfers to government	-35	-37	-128	-128	-136	-140	-147	-182	-223	-230	-221	-321	-430
9. <i>Equals:</i> Personal Disposable Income	8,765	9,412	9,875	10,241	10,431	11,187	12,030	12,818	14,119	15,624	17,027	18,381	20,144
10. <i>Deduct:</i> Personal expenditure on consumer goods and services	-8,154	-8,732	-9,147	-9,478	-9,655	-10,320	-11,062	-11,758	-12,898	-14,216	-15,447	-16,633	-18,111
11. <i>Deduct:</i> Transfers to corporations	-47	-52	-63	-73	-74	-79	-82	-88	-103	-117	-126	-139	-161
12. <i>Deduct:</i> Transfers to rest of the world	-36	-37	-40	-40	-36	-37	-42	-42	-44	-45	-55	-44	-49
13. <i>Equals:</i> Saving of persons and unincorporated business	528	591	625	650	666	751	844	930	1,074	1,246	1,399	1,565	1,823

# Selected Economic Indicators

## Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)

Hours

\_42

\_41

\_40

\_39



New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)

\$ Billion

\_4.0

\_3.5

\_3.0

\_2.5

\_2.0



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)

\$ Million

\_200

\_160

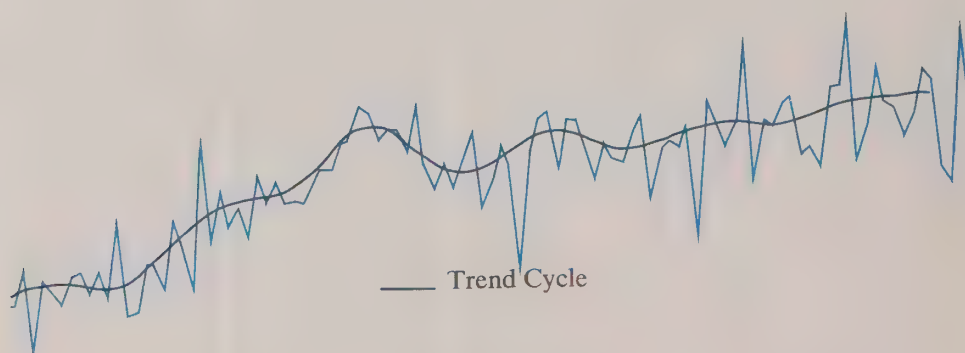
\_120

\_100

\_80

\_60

\_40



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

Thousand

\_100

\_90

\_80

\_70

\_60

\_50

\_40

— Monthly  
— Quarterly



1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971



## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

Scale L1  
\$ Billion  
\_35  
\_30  
\_25  
\_20  
\_15

**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Scale L2  
Index  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

Scale L1  
\$ Billion  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35

— Current Dollars  
— Constant (1957) Dollars

new series  
constant (1961) dollars

**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Scale L1  
Dollars  
\_3.50  
\_3.00  
\_2.50  
\_2.00

1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

# Coincidental and Lagging Indicators

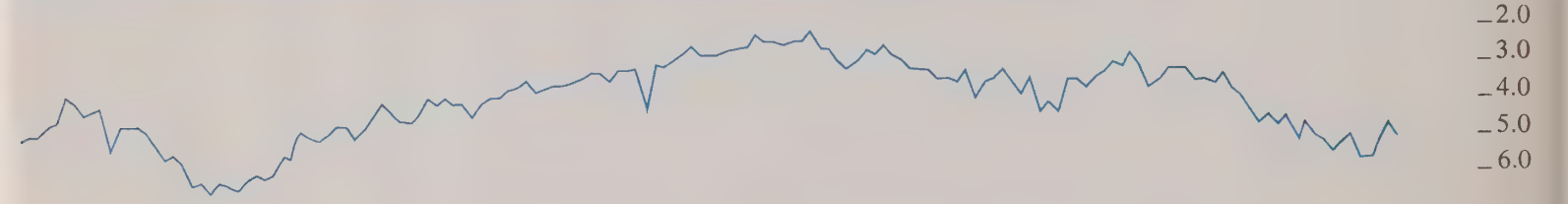
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



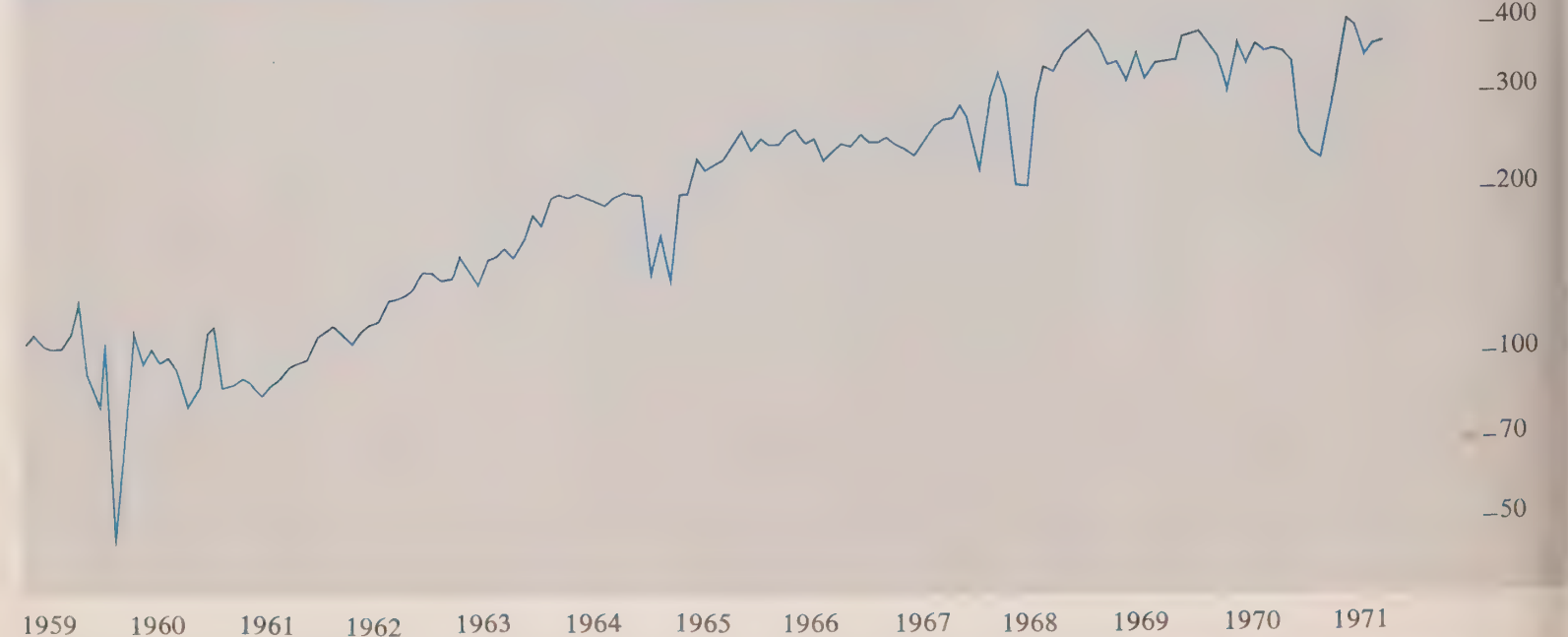
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)





Leading Indicators	1971														
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August	
Average Weekly Hours Worked in Manufacturing															
New Orders in Manufacturing Industries <sup>c</sup>	39.5	40.0	39.6	39.5	39.4	40.1	39.2	38.8	39.3	39.9	39.5	40.0			
Building Permits Issued in Ontario, Non-Residential Construction	3,804	3,883	3,754	3,697	3,689	3,686	3,885	4,034	3,097	3,975	3,896	4,001	3,963	4,229	
Urban Housing Starts (Annual Rate)															
Money Supply <sup>c</sup>	81.6	93.8	120.3	103.1	100.0	90.6	97.0	117.5	112.0	77.1	73.3	138.1	91.5		
T.S.E. Industrial Index <sup>u</sup>	67,500	77,500	69,200	106,000	103,800	82,300	60,600	55,600	48,400	88,000	67,900	75,000	72,300	99,300	
Business Failures <sup>u</sup>	29,812	30,042	30,194	30,624	31,197	31,696	32,135	32,511	33,144	33,495	34,292	34,921			
Business Failures — Liabilities <sup>y</sup>	157.36	160.28	165.8	162.1	168.7	174.4	178.1	177.4	185.3	181.6	177.8	180.7	177.5	176.3	
	73	48	55	71	74	71	71	70	100	81	88	66	60		
	3.1	2.8	5.3	8.1	5.8	7.7	11.6	4.5	5.2	3.8	3.4	5.3	8.0		
Coincidental and Lagging Indicators															
Gross National Product <sup>c</sup> (Annual Rate)			84,988			86,376			87,900			91,012			
Average Hourly Earnings in Manufacturing															
3-Month Treasury Bill Rate <sup>c,u</sup>	3.22	3.22	3.18	3.21	3.22	3.33	3.37	3.40	3.43	3.43	3.49	3.47			
Cheques Cashed in Clearing Centres <sup>1</sup>	5.70	5.51	5.39	5.01	4.40	4.44	4.68	4.06	3.16	3.00	3.03	3.37	3.57		
Retail Trade	6,358	6,774	7,184	6,945	6,475	6,553	6,589	7,190	7,956	7,519	7,062	7,110	7,457		
Labour Force	918	902	930	896	903	910	900	941	947	995	992	989	983		
Employed	3,121	3,129	3,145	3,166	3,167	3,151	3,215	3,223	3,197	3,207	3,232	3,231	3,230	3,232	
Unemployed	2,976	2,996	3,003	3,030	3,020	2,996	3,042	3,054	3,040	3,023	3,052	3,067	3,083	3,071	
Unemployed as % of Labour Force	000's	142	158	147	156	162	173	169	157	184	180	164	147	161	
Wages and Salaries	Per Cent	4.5	5.0	4.6	4.9	5.1	5.4	5.2	4.9	5.7	5.6	5.1	4.6	5.0	
Index of Industrial Employment	\$ Million	1,584	1,601	1,596	1,600	1,611	1,646		1,673	1,693	1,721	1,730			
	1961 = 100	131.1	131.7	130.2	130.0	129.7	132.0	131.5	132.2	131.7	131.5	132.7	134.6		
Index of Industrial Production <sup>c</sup>															
Total Manufacturing <sup>c</sup>	1961 = 100	170.0	171.0	169.1	168.6	171.5	170.5	171.7	172.9	172.5	171.2	174.7	175.7	176.3	178.7
Non-Durables <sup>c</sup>		165.4	166.5	163.1	164.3	165.5	165.1	167.1	169.0	168.3	167.5	171.2	172.0	171.9	174.6
Durables <sup>c</sup>		152.8	151.8	152.2	152.0	155.3	152.9	152.7	150.3	150.5	150.1	154.1	155.1	154.7	156.1
Mining <sup>c</sup>		181.7	184.4	176.4	179.9	178.4	180.6	185.3	192.7	190.9	189.4	192.8	193.5	193.7	198.1
Electric Power and Gas Utilities <sup>c</sup>		173.4	174.6	178.2	175.4	186.7	180.9	177.4	176.0	176.6	174.4	179.3	180.6	184.0	183.1
Primary Energy Demand (Annual Rate)		206.1	205.9	208.4	195.0	194.8	201.0	203.2	201.9	202.2	198.5	197.4	198.6	202.1	206.7
Exports (including re-exports) <sup>c</sup>	BKWH	65.03	65.68	66.80	65.56	64.32	66.79	67.62	67.76	68.14	67.21	65.74	67.86	67.33	69.82
Imports <sup>c</sup>	\$ Million	1,422.7	1,321.1	1,391.3	1,416.0	1,479.8	1,312.0	1,442.0	1,395.0	1,506.0	1,397.0	1,463.6	1,550.0	1,457.0	1,601.0
	\$ Million	1,187.5	1,162.3	1,184.5	1,006.0	1,138.0	1,020.0	1,128.0	1,181.4	1,338.8	1,181.2	1,279.9	1,344.0	1,321.0	1,389.0
Unclassified Indicators															
Foreign Exchange Reserves <sup>c,u</sup>	U.S. \$ Million	3,689	3,848	3,785	3,831	3,871	3,813	3,816	3,868	3,944	3,962	3,998	3,977		
Industrial Materials Price Index <sup>c,u</sup>	1935-39 = 100	270.3	268.5	269.2	267.4	266.4	264.2	264.2	266.0	266.4	267.6	267.1	267.4	266.6	
Consumer Price Index <sup>c,u</sup>	1961 = 100	130.5	130.5	130.2	130.3	130.3	129.8	130.3	130.9	131.3	132.2	132.7	133.0	134.1	135.0

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.







# Ontario Economic Review

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Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

November/December 1971

Volume 9, Number 6

## The Ontario Economy

## Federal and Ontario Fiscal Policy in 1970 and 1971

Bernard Jones and Jill Berringer

Department of Treasury and Economics

## Selected Economic Indicators

A publication of the  
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and Economics  
Government of Ontario

Hon. W. Darcy McKeough  
*Treasurer of Ontario and  
Minister of Economics*

H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Department of Treasury and Economics, Frost Building, Queen's Park, Toronto 182, Ontario.

### About the Review

In the past two years, the fiscal impact of the Ontario government in the provincial economy has been almost as pronounced, in relative terms, as that of the federal government in the Canadian economy. Accordingly, the Ontario budget has become a key economic document insofar as the short-term economic stabilization of the Ontario economy is concerned.

The feature article for this issue of the *Ontario Economic Review* traces the development of fiscal policy in Canada and Ontario over the past two years and reviews the influence of the economic setting on fiscal policy design. The article presents estimates of the current expansionary fiscal thrust of the total government sector in Canada, followed by a detailed review of recent federal and Ontario budgetary developments. It also compares and contrasts budgetary changes introduced at both levels to help stimulate economic recovery and to improve the unemployment situation.

The article was prepared by Bernard Jones and Jill Berringer in the Taxation and Fiscal Policy Branch, Department of Treasury and Economics. The authors acknowledge with appreciation the contribution of Christine Campbell in the preparation of the charts and tables.

### Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs; some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14-16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *This applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## Gross National Product, Third Quarter, 1971

The production of goods and services in Canada continued to increase in the third quarter of last year, but at a lesser rate than in the second quarter. Statistics Canada recently released preliminary results of the National Income and Expenditure Accounts for the third quarter of 1971 which show a continuation of the pattern of substantial gains in production evident since the fourth quarter of 1970. A feature of the third quarter was a sharp increase in the industrial sector, particularly noticeable in the indicators of production. However, the significant increase in the number of jobs created in the third quarter was not reflected in a significant decline in the unemployment rate due to an unusually rapid growth in the labour force. The implicit price index for GNP rose by 0.9 per cent compared with a 1.3 per cent increase in the second quarter.

Canada's gross national product, seasonally adjusted at annual rates, rose by \$2.3 billion in the third quarter to reach a level of \$37.7 billion. This gain was somewhat larger than that realized in the first quarter of \$2.0 billion, but considerably smaller than the \$3.0 billion increase in the second quarter. In percentage terms, GNP rose by 2.5 per cent in the third quarter after rising by 3.4 per cent in the second quarter, and by 2.3 per cent in the first quarter. After discounting that part of the increase in the value of goods and services due to higher prices, GNP rose by 1.6 per cent in the third quarter.

This is the fourth consecutive quarter showing a sizable gain in real output. GNP is 10.2 per cent larger in the third quarter of 1971 than for the corresponding period in 1970. Real growth during this time amounted to 6.9 per cent. A nine months comparison also shows an acceleration in the pace of economic growth. In the first nine months of 1971, GNP was 8.7 per cent larger in value and 5.3 per cent larger in volume than in the comparable period in 1970. This compares with a growth of GNP for 1970 over 1969 of 5.3 per cent in value and 3.3 per cent in volume. Under the assumption that no further growth in output took place last year, the annual real growth of gross national product would be 5.6 per cent; if output grew 1.0 per cent in the fourth quarter, the increase for the year as a whole would be 5.9 per cent.

Personal expenditure on consumer goods and services provided a major stimulus to demand in the third quarter though to a lesser

extent than in the preceding quarter. Consumer spending rose by 2.0 per cent in the third quarter to \$54.17 billion compared with a 4.2 per cent rise in the second quarter.

Personal income and personal disposable income showed lower rates of increase in the third quarter than in the first two quarters of last year. This was especially true of personal disposable income that slowed to a growth of 1.4 per cent in the third quarter, after making impressive gains of 4.1 per cent in the second quarter and 3.0 per cent in the first quarter. Personal saving as a proportion of personal disposable income dropped to 8.0 per cent in the third quarter from 8.6 per cent in the preceding quarter.

A major source of weakness in economic activity in the third quarter was business spending on facilities, machinery and equipment, which had shown strong gains in the second quarter. In real or volume terms, business investment in machinery and equipment during the third quarter was unchanged from the second-quarter level. In non-residential construction, spending on new buildings increased. However, it was more than offset by a decline in engineering construction (other than highways and railways) which had risen quite sharply in the second quarter.

Consumer credit balances outstanding continued to rise in the third quarter, reaching a record \$11.75 billion. Also consumer credit as a proportion of personal disposable income rose to approximately 19.8 per cent compared with 19.5 per cent in the second quarter. This indicates consumers are increasingly willing to borrow to finance their expenditures on goods and services.

The continuing, but not outstanding pace of recovery in the third quarter occurred following a stimulating federal budget on June 18th. However, such stimulation is unlikely to have had immediate effects because of the time lags involved before cuts in personal and corporate taxes result in increased spending. The August 15th package of United States economic moves may have had a damaging effect on the economy's over-all performance in the July-through-September period but Statistics Canada says it is still too early to determine the extent. The latest GNP figures also appear to clearly indicate that the economy needed the stimulation provided in the October 14th federal budget: the introduction of temporary tax cuts of three per cent and seven per cent for individuals and corporations respectively.

At present the impact of the U.S. ten per cent import surcharge appears to have not been as severe as earlier expected. Federal Department of Industry, Trade and Commerce officials recently acknowledged a decline in exports to the United States of some commodities which were subject to the surcharge but refused to specify the commodities or companies involved.

Exporters affected by the surcharge generally attempted to maintain their level of exports in the hope that the surcharge would soon be removed or that they would be compensated, at least in part, under the federal Employment Support Act. This resulted in less reduction in exports and employment in some industries than was expected earlier.

The surcharge remained in effect for a little more than four months, however, it is not clear to what degree it affected Canadian industry. Federal officials say a comprehensive assessment of the surcharge's impact is not currently being attempted.

An accurate assessment of the impact of the surcharge on exports to the United States would be difficult because of the many factors affecting export trade. For many commodities it is impossible to separate the effects of the general downturn in U.S. economic activity in the past two years from the effects of the surcharge. Moreover, some exports subject to the surtax, such as machinery and capital goods, have long lead times on orders and contracts. Consequently the impact of the surcharge will be lagged and may not be felt for six to nine months. Some products are also produced and exported under long-term contracts, and therefore the effects might not be evident for some time, if at all.

The latest foreign trade figures indicate that the surcharge did not produce an overall reduction in exports to the United States. Seasonally adjusted exports to the U.S. have increased in each of the past three months and in October were approximately 13.0 per cent higher than in October, 1970. Cumulative exports to the United States in the first ten months of last year were nine per cent higher than a year earlier.

In one sector particularly, concern has been expressed over the probable adverse effects of developments during the past year-and-one-half. Canada's machinery and equipment producing industries, which are largely located in Ontario, have suffered a number of setbacks in the last eighteen months in their principal export market —



the United States. On June 1st, 1970 the Canadian dollar was freed and has subsequently appreciated to approximate parity with the U.S. dollar. On August 15th, the U.S. imposed a ten per cent surcharge on dutiable imports which affected approximately one-third of Canada's machinery exports to that country. The lifting of the ten per cent surcharge as the result of a major overhaul of world exchange rates that took place in Washington on December 8th will terminate the buy-American preferences in the U.S. investment tax credit plan. Future sales of Canadian machinery and equipment to the U.S. to a large extent now depend on what value the Canadian dollar takes relative to the devalued U.S. dollar.

Throughout the 1960's Canada achieved considerable success in adapting its machinery industry to modern markets. Export promotion, significant tariff reductions and the devalued Canadian dollar helped to stimulate this trade. As a result our machinery industries exported an increasing percentage of their products to the United States. Nearly two-thirds of the approximately one billion dollars worth of machinery and equipment Canada exported in 1970 went to the U.S. To the end of August this year Canada exported about \$440 million worth of these goods to the U.S., down moderately from the same period last year. This situation is attributable to both a poor U.S. market and the revalued Canadian dollar.

In the short run the good-will built up over the years between Canadian producers and U.S. buyers will probably help to maintain Canadian equipment exports. Also, prices have not always been the key consideration, particularly for machinery requiring custom design. Export figures for the last four months of 1971 will probably show the initial impact of the now eliminated surcharge and investment tax credit scheme. The true story will become evident this year when Canada may well lose a large percentage of machinery and equipment sales to the United States especially if the Canadian dollar moves ahead of its U.S. counterpart.

### **The Labour Force**

Mid-November labour force data for Canada, recently released by Statistics Canada showed little change between October and November on a seasonally-adjusted basis. The seasonally-adjusted rate of unemployment fell marginally to 6.6 per cent from 6.7 per cent in October. Actual unemployment

rose to 5.8 per cent from 5.1 per cent in the previous month. This was the highest rate since last June.

By regions, the seasonally adjusted unemployment rate decreased on the prairies to 4.5 per cent and increased in British Columbia to 6.9 per cent. The figure remained the same — 9.7 per cent — for the Maritimes. In Quebec, it dropped slightly to 8.4 per cent from 8.5. Ontario's unemployment rate stood constant at 5.6 per cent. The actual rates of unemployment in November stood at: 8.0 per cent in the Atlantic Provinces; 7.3 per cent in Quebec; 4.6 per cent in Ontario; 4.2 per cent on the Prairies and 7.1 per cent in British Columbia.

### **Task Force Report on Foreign Investment**

In late 1970, the Ontario Department of Treasury and Economics initiated the formation of a small interdepartmental task force to study the national, as well as provincial aspects of the issue of foreign investment and to propose policy alternatives for the consideration of the Ontario Cabinet. The Task Force was mobilized for two basic reasons. First the presence of a large degree of foreign investment in the Canadian economy has engendered much concerned public debate and necessitated that governments in Canada make explicit decisions on the problem. Secondly, since the Government of Canada has prepared a special study on the effects of investment from abroad and will submit recommendations for appropriate Canadian policies, it was felt that the background for such policies as might affect the Province of Ontario should be studied and defined so that the Provincial interest could usefully be presented in the ensuing debate.

The basic conclusion of the report suggests that Canadian policies should be re-evaluated with the objective of creating conditions more favourable to the growth of Canadian control of the economy and to the expansion of manufacturing industries relying on genuinely Canadian technology and product design.

The Task Force findings indicate that current inflows of direct investment from abroad do not play a major role in maintaining high levels of economic activity in Canada. In their opinion, only a relatively small reduction in the gross national product would result if new capital inflows ceased — provided of course, that the re-investment of present profits in Canada's foreign-controlled

sector remain at reasonably high levels. In view of the size of this sector of the Canadian economy, the maintenance of a healthy investment climate is considered fundamentally important to avoid a worsening of the present unemployment situation. Therefore, any Canadian policies on foreign investment must incorporate a high degree of moderation.

The report emphasizes the essential role of the federal and provincial governments to define explicitly and collectively their policy orientations and to decide whether Canada should move towards continentalism or towards more reliance on indigenous Canadian initiatives. "It is only when this crucial decision of policy has been consciously and explicitly adopted that detailed strategies can be worked out to achieve objectives under existing policy constraints."

The Task Force sees two workable alternatives for Canada's policy on foreign investment:

- a continuation of our present "open door" policy, and
- a movement towards moderate economic nationalism.

A continued "open-door" policy, as viewed by the committee, involves incipient threats to Canada's continued economic independence and its cultural distinctiveness. Moderate economic nationalism holds the promise of a gradual reversal of present trends without at the same time endangering economic stability.

Apart from recommending a moderate stance toward foreign investment in Canada, the report makes these recommendations:

- "Ontario's position on the foreign investment issue be presented to the Government of Canada as our contribution toward shaping an overall Canadian policy designed to meet the needs and aspirations of our citizens;
- "Moderation and flexibility be built into such a policy as necessary prerequisite for its successful implementation, and that
- "Radical measures aimed at Canadianizing industries at a fast pace be avoided as self defeating, primarily because they would engender fear and uncertainty which perhaps precipitate an investment crisis."

The Task Force was composed of government economists from three departments: the Department of Treasury and Economics, the Department of Trade and Development, and the Department of Financial and Commercial Affairs.



Ernest Jones and Jill Berringer  
Department of Treasury and Economics

## INTRODUCTION

This paper traces the development of fiscal policy in Canada over the past two years. It reviews the key influence of the economic scenario on fiscal policy design, and to put recent fiscal policy developments in perspective, it presents rule-of-thumb estimates of the changing fiscal impact of the government sector in the economy. The paper emphasizes these changes in fiscal policy that have occurred at the federal and Ontario levels of government. In particular, it presents a detailed analysis of federal and Ontario budgetary changes.

The major focus of the paper is fiscal policy as an instrument for short-term economic stabilization. The importance of money, debt management, exchange rate and other policies in this regard is, of course, acknowledged, and mention of the influence of such policies will be made when appropriate. Nevertheless, this paper concentrates on recent budgetary changes introduced at both the federal and Ontario levels of government to help stimulate economic recovery and a substantial improvement in the unemployment situation. It does not, however, consider in any depth the balance of policies or, if you like, policy-mix — appropriate for the longer-run attainment and maintenance of full-employment.

The specification of major economic performance goals must precede the design of fiscal and economic policy, and the major performance goals for Canada have been adequately specified by the Economic Council of Canada. In particular, the Council has estimated economic growth and employment goals.<sup>1</sup> Budget Paper A in the 1971 Ontario Budget contains parallel estimates for the Ontario economy.<sup>2</sup> Therefore, the first section of this paper begins with an outline of the goals of fiscal policy in Canada, followed by a terse review of the economy's performance relative to the achievement of the goal of "full" or "high" employment. This economic review is seen as the backdrop for the design and implementation of the present expansionary course of fiscal policy.

The second section of the paper discusses the importance of the budget as an economic instrument, and presents estimates of the recent expansionary fiscal thrust of the total government sector in Canada, followed by a detailed review of recent federal and Ontario budgetary developments. It compares and contrasts the budgetary changes, as well

as presenting estimates of the changing fiscal impact of both levels of government. The third section discusses some important problems of short-term economic stabilization policy as evidenced in the second section of the paper.

## I ECONOMIC GOALS AND PERFORMANCE

### The Long-run Target of Economic and Fiscal Policy

The overall objective of economic and fiscal policy is to achieve high, sustained and non-inflationary rates of economic growth, high levels of employment, an equitable distribution of rising incomes and a sound external position. In the long-run, the optimum rate of economic growth that is consistent with the attainment of the other goals of economic and fiscal policy is the "full-employment" or "potential" growth rate. This particular rate of economic growth is the long-run target of economic and fiscal policy. For the Ontario economy it is estimated that relatively full employment is achieved when approximately 97.0 per cent of the labour force is employed and the per annum rate of increase in real gross provincial product is 5.5 to 6.0 per cent. For Canada, it has been estimated that the potential rate of growth is between 5.2 and 5.5 per cent with something less than 4 per cent of the labour force unemployed. The major explanation for the higher rate of potential growth of the Ontario economy is the more rapid increases in population and labour force.

### The Short-run Problem of Economic Stabilization

In the short-run, the actual rate of economic growth frequently diverges from its potential full-employment rate and causes undesirable fluctuations in the level of employment. Thus, the short-run target of economic and fiscal policy is the stabilization of the rate of growth of the economy around its potential rate. The problem of economic stabilization is to identify the causes of instability and design the appropriate policy-mix to restore stability. Fiscal policy — the main concern of this paper — is an important instrument of stabilization policy. However, it is used in conjunction with other policy instruments, the most important of which is monetary policy.

Stabilization policy is an art, not a science, and therefore, is imprecise. In fact "impre-

cise" is perhaps too kind a term to use. This particular form of art is frequently poorly practised, often being applied too late and in the wrong manner. The major difficulty arises from the fact that stabilization policy has to deal with conflicts inherent in its basic objective. Since 1969, as in the 1957-62 period, for example, there has been obvious conflict once again between the pursuit of less inflationary economic growth on the one hand, and the twin goals of high and sustained growth and full-employment on the other.

### The Economic Backdrop to the Expansionary Policies of 1970 and 1971

#### Fiscal and Monetary Policies of Restraint

The sharp deterioration in the economy's performance in 1970 was almost entirely attributable to the impact of severe deflationary federal fiscal and monetary policies.<sup>3</sup> According to our rule of thumb estimates, the federal national account's budget surplus on a full-employment basis increased substantially in 1969,<sup>4</sup> accounting for about two-thirds of the net restrictive fiscal impact of the total government sector. The Ontario fiscal impact was also restrictive in 1969 and reinforced federal efforts to reduce inflationary pressures.<sup>5</sup>

In addition to the tightening of fiscal policy, the rate of increase in money supply (broadly defined to include currency outside banks and all chartered bank deposits held by the general public) slowed considerably to 4.0 per cent in 1969, after increasing by 16.0 per cent and 13.0 per cent in 1967 and 1968 respectively. Despite the money squeeze, however, the demand for new credit

<sup>1</sup>See, *Economic Council of Canada, Performance and Potential mid-1950's to mid-1970's*, (Ottawa: Information Canada, September, 1970) and, *Performance in Perspective 1971*, (Ottawa: Information Canada, October, 1971).

<sup>2</sup>Hon. W. Darcy McKeough, "New Directions in Economic Policy Management in Canada", Ontario Budget 1971, (Toronto: Department of Treasury and Economics, April, 1971).

<sup>3</sup>The Economic Council had this to say about the restrictive impact of fiscal policy in 1968 and 1969: "The degree of fiscal restraint in Canada since 1968, however, has been very strong — much stronger than many Canadians have realized. In fact, in 1969, such restraint appeared to have been stronger than at any time since the Korean War in the early 1950's, when total demand was clearly excessive." *Performance and Potential*, p. 52.

<sup>4</sup>See page 6.

<sup>5</sup>See page 9.

that was satisfied by the available supply repeated 1968's record-high level. Consequently, the impact of monetary restraint on total demand was not great in 1969 even though interest rates rose to post-war highs.

### The Lagged Impact of Restrictive Policies

The inevitable lagged impact of monetary and fiscal policies of restraint appeared in 1970 when the level of domestic demand increased in real terms by only 0.7 per cent, compared with an increase of 5.9 per cent the year before. There was, of course, a consequent reduction in import demand and this factor, combined with unusual strength in foreign demand for Canadian exports and large net capital inflows — resulting partly from the high level of domestic interest rates and partly from external financial developments — forced the unpegging of the Canadian dollar in May, 1970. Over the next four months the external value of the Canadian dollar rose to a level close to par with the United States' dollar. It has remained at a relatively high value ever since.

### Actual versus Potential Performance

Chart I shows the deterioration in the performance of the Canadian economy since 1967 relative to its potential. The gap between actual and potential levels of constant dollar GNP has widened considerably over the period, reaching around 4.0 per cent of potential real GNP in 1970. The rate of real economic growth last year dropped to 3.3 per cent, from 5.1 per cent in 1969, in comparison to the potential growth rate of 5.5 per cent. The Ontario economy, of course, experienced a parallel deterioration in economic performance over the period.<sup>6</sup>

The rate of unemployment mirrored the

increasing shortfall of output below potential by rising sharply in Canada and Ontario. In Canada, the rate rose from 4.7 per cent in 1969 to a ten-year high of 5.9 per cent in 1970. In Ontario, it increased to 4.3 per cent in 1970 compared with 3.1 per cent the year before, but was on a sharply rising trend during the year.

Consequently, by the third-quarter of 1970 events over the 1965-70 period had retraced the "inflation-unemployment-high valued dollar" path of 1957-62. Broadly speaking, this was the economic climate that faced the policy-makers late in 1970 and in early 1971. It formed the economic backdrop to the expansionary shift in federal and Ontario fiscal policies discussed in Section II of this paper.

## II FEDERAL AND ONTARIO BUDGETARY DEVELOPMENTS IN 1970 AND 1971

### The Budget as an Economic Document

In view of the federal government's dominant role in economic stabilization in Canada, the federal budget, which is the fiscal instrument through which its stabilization policy is implemented, is a key economic document. It sets out in general terms the federal view of the current and prospective economic situation and details the fiscal plan that appears to be appropriate under the circumstances. Other levels of government, and the private sector, take account of the federal budget plan in making their economic decisions.

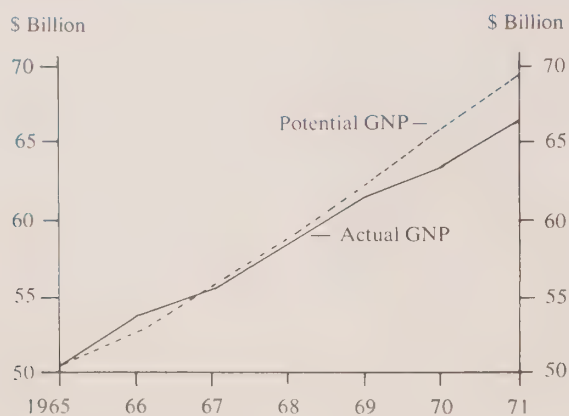
The provincial level of government has generally been viewed as playing a passive, or at best (or worst, depending on which side of the fence you are) moderately reactive

role in short-term economic stabilization. However, in its budget for 1971-72, Ontario Government has presented a fiscal plan that contrasts sharply with this view. The record-high budgetary deficit of \$553 million is planned, compared with a deficit of \$459 million last year. This increase in the budgetary deficit of \$459 million is proportionately much larger relative to the size of the Ontario economy than is the planned \$1.1 billion federal swing relative to the size of the Canadian economy. In addition, the Ontario fiscal plan is based on the use of the full employment budgeting technique described in this section. The full-employment budget estimates clearly and objectively demonstrate that the planned provincial budget will have a significant expansionary fiscal impact in 1972.<sup>8</sup> In fact, it will be argued later that *so far as the short-term stabilization of the Ontario economy is concerned, the provincial budget is now just as important an economic document as that of the federal government.*

Budget plans frequently undergo substantial in-year changes. These are basically of two kinds. Firstly, there are changes that result from the influence on revenues and expenditures of variations in the level of economic activity from that originally anticipated. Such changes are *automatic* in the sense that they reflect the influence of the economy on the given budget plan which is not itself necessarily changed at all. Revenues from personal income taxes, for example, rise and fall with incomes (actually they do so to a proportionately greater degree due to the progressive nature of the personal income tax). Also, unemployment insurance welfare benefit payments move inversely to the level of economic activity, rising when the economy weakens and vice versa. Secondly, there are changes arising from alterations to the basic fiscal plan itself. Tax rates may be changed, for example, or expenditure programs introduced. These changes are *discretionary* in the sense that they change the impact of the original budget plan on the economy given any level of economic activity.

Analyzing past fiscal policy, or evaluating alternative budget plans for the current and future fiscal years, requires that these two kinds of influences be separated. In the following analysis of federal and Ontario budgetary developments in 1970 and 1971, a rough separation of automatic and discretionary influences is attempted using two different but complementary approaches.

**Chart 1 — Actual and Potential Economic Growth in the Canadian Economy, 1965-71 (1961 dollars)**



Source: Based on data published by Statistics Canada and estimates by Department of Treasury and Economics.

<sup>6</sup>Hon. W. Darcy McKeough, Ontario Budget 1971, p. 47.

<sup>7</sup>See, Hon. W. Darcy McKeough, Ontario Budget 1971, and Introduction to Supplementary Estimates and Tax Legislation, (Toronto: Department of Treasury and Economics, December, 1971).

<sup>8</sup>A reading of the Ontario Budget 1971 will show that the Province's acceptance of greater responsibility for short-term economic stabilization policy has arisen out of the failure of federal policies.



## Approaches to Analysis of Fiscal Policy

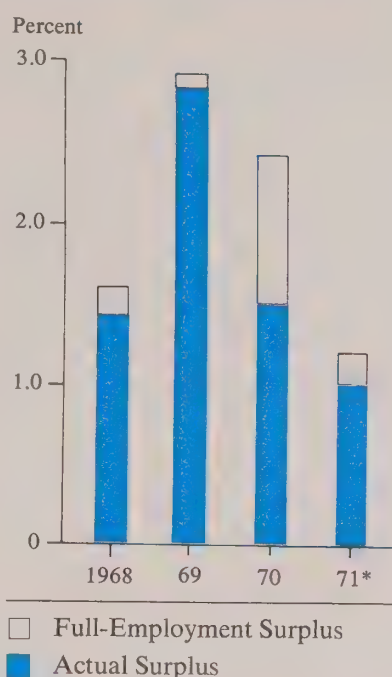
The first method estimates the change in the fiscal impact of the national accounts budget<sup>9</sup> measured on a full-employment basis. Its basic data source is the national income and expenditure accounts. Only the national accounts budget is defined in such a way as to make the transactions of the government sector directly consistent, in an economically meaningful sense, with the other major sectors of the economy. However, it excludes a substantial amount of purely financial transactions, such as loans and advances, which are included in the cash budget. Loans and advances do, of course, have an economic impact. Consequently, a comparison of changes in the national accounts and cash budgets is useful.

The second method traces in some detail changes in budget plans, or forecasts, on both the administrative and cash budget bases. Its basic data source is the various budget statements and the public accounts. This approach is complementary in that it explains the changes in revenues and expenditures that bring about changes in the fiscal impact of the budget. More than that, it looks at the total cash requirements of government and thus gives broader coverage than the national accounts budget. Finally, it examines changes in budget forecasts and compares them with realizations.

The first method, by contrast, covers only actual developments in the national accounts budget measured on a full-employment basis. A major advantage of this approach is that it allows objective and consistent period-by-period comparison of fiscal impact.

The full-employment budget estimates may be made for the administrative, cash or national accounts budgets. The latter is generally used because of its particular economic significance; it represents a fair compromise between the narrower administrative and cash budgets. Basically, the full-employment budget estimates are made in the following manner; first, an estimate is made of the economy's potential GNP given full-employment is achieved on a continuing basis; second, estimates are made of what the levels of revenues, expenditures and surplus\* would be at potential levels of GNP and, third, the actual surplus is compared with the full-employment surplus. The difference between the actual and full-employment surpluses measures the automatic influence on the budget of variations in the performance of the economy from its

**Chart 2 — Total Government Sector in Canada Actual and Full-Employment Surpluses, 1968-1971**  
(As a percent of potential GNP)



\*First-half seasonally adjusted at annual rates.  
Note: Both actual and full-employment surpluses are calculated on a national accounts basis, including CPP and QPP transactions. The full-employment estimates are derived by estimating the change in revenues that would occur if full employment were achieved; expenditures are assumed to be unchanged. For purposes of this analysis, full employment is assumed to be consistent with a level of employment of about 96 per cent and unemployment at about 4.0 per cent.

Source: Based on data published by Statistics Canada and estimates by Department of Treasury and Economics.

potential level of activity. The change in the full-employment surplus from period to period, measured as a per cent of potential GNP, gives the net expansionary or contractionary fiscal impact of the budget on the economy.<sup>10</sup>

The actual and full-employment surpluses of the total government sector in Canada over the period 1968 to 1971 are shown in Chart 2. The importance of separating automatic and discretionary budgetary influences in gauging the fiscal impact of the government sector can perhaps be better understood by reference to this Chart. Earlier, it was shown (see Chart 1) that the gap between actual and potential levels of economic activity widened considerably in 1970. Consequently, the auto-

matic influence of the weak performance of the economy on the combined budgets of all levels of government in Canada depressed revenues significantly below their potential levels. And, since expenditures are assumed to remain unchanged, the government sector surplus was also reduced below its full-employment level.

Chart 2, therefore, shows that the decline in the actual surplus in 1970 was much greater than that in the full-employment surplus. This is simply due to the fact that the reduction in the actual surplus comprises both the impact of expansionary discretionary influences and the automatic depressive influence of the economy on the budget. Both sets of influences worked together to reduce the surplus, but since only discretionary influences represent a change in the fiscal impact of the budget on the economy, the decline in the actual surplus in 1970 substantially overstates last year's expansionary fiscal swing. In fact, a close look at Chart 2 will show that the actual net fiscal impact in 1970 (the change in the full-employment surplus over 1969) is equivalent to about one-half of the reduction in the actual surplus.

In 1971, by contrast, the further decline in the actual surplus understates the expansionary impact of the government sector. The full-employment surplus has declined more rapidly than the actual surplus because the downward influence on the surplus of discretionary changes (reflected by the change in the full-employment surplus), has been partially offset by an automatic increase in revenues as the pace of economic growth picked up sharply in the first-half of this year.

The net fiscal impact of the total government sector in Canada is shown in Chart 3. It clearly illustrates the shift to expansion in 1970 and 1971. It will be shown later that the swing in federal policies is most respon-

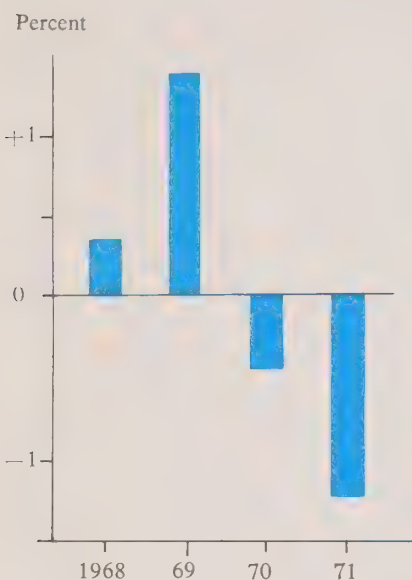
<sup>9</sup>A detailed review and evaluation of the administrative, cash and national accounts budgeting concepts is contained in R. M. Will, *The Budget as an Economic Document, Studies of the Royal Commission on Taxation No. 1*, (Ottawa: Queen's Printer, 1966).

<sup>10</sup>For a useful introductory note on the use and interpretation of the full-employment budget, see R. Solomon, "A Note on the Full-Employment Budget Surplus", *Review of Economics and Statistics*, XLVI (February 1964), pages 105-108. A detailed theoretical and statistical treatment of the concept is found in M. Levy, *Fiscal Policy, Cycles and Growth, National Industrial Conference Board, Studies in Business Economics, No. 81* (New York: The Conference Board, 1962).

\*For the sake of brevity the term 'surplus' may be applied, in instances where the context is clear, to cover either true surpluses or negative surpluses (deficits).

sible for this development, as it was for the period of restraint in 1969.

**Chart 3 – Total Government Sector in Canada Net Fiscal Impact, 1968-1971**  
Contractionary (+) or Expansionary (–)  
(As a percent of potential GNP)



Note: The net fiscal impact measures the year-to-year change in the relative full-employment surplus shown in Chart 2.

Source: Based on data published by Statistics Canada and estimates by Department of Treasury and Economics.

### Federal Budgetary Developments in 1970 and 1971

#### Full-Employment Budget Estimates

The federal full-employment surplus on a national accounts basis, over the period 1968-71, is plotted as a percentage of potential GNP in Chart 4. The year-to-year changes in the relative full-employment surplus, which are shown in Chart 5, measure the net fiscal impact of the federal budget. That is, the net infusion or withdrawal of funds by the federal government (reduction or increase respectively in its full-employment surplus) is measured relative to the full-employment potential performance of the economy. The automatic influences of the economy on the budget are removed and the changes unambiguously represent discretionary influences only. It is quite clear from Chart 5 that the planned fiscal impact in 1971-72 of the federal national accounts budget on a full-employment basis is more expansionary than that of 1970-71. It is

equally clear that the expansionary thrust of the past two years has been necessary to reverse the very restrictive fiscal policy posture of 1969.

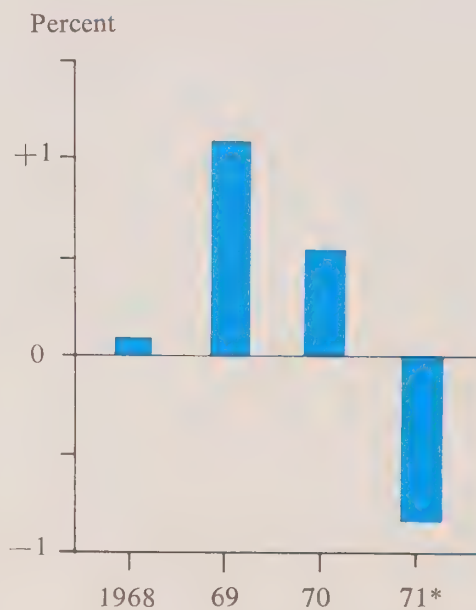
#### Budget Plans versus Realizations

The clearest illustration of the federal government's *intention* to strengthen its fiscal impact on the economy during 1970 and 1971 is provided by examining changes in federal *forecasts* of budgetary and total cash requirements<sup>11</sup> during the two fiscal years. To trace the details of changes in the *actual* fiscal impact of the federal government's budget, however, it is necessary to examine *actual* budget changes. Both forecasted and actual changes, which are summarized in Table 1, are discussed below.

#### Original Federal Fiscal Program for 1970-71

The fiscal plan for 1970-71, presented in the March 12, 1970 budget,<sup>12</sup> was a continuation of the previous year's restrictive policy which aimed at reducing inflationary pressures. It contained an extension to the end of 1971 of an earlier decision to defer depreciation allowances on new commercial projects in

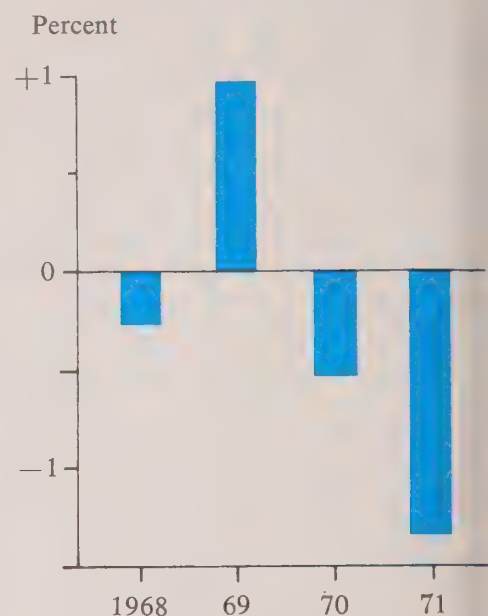
**Chart 4 – Federal Government Full-Employment Surplus, 1968-1971**  
(As a percent of potential GNP)



\*Estimated impact per October 14 budget.  
Note: For explanation, see Chart 2.

Source: Based on data published by Statistics Canada and estimates by Department of Treasury and Economics.

**Chart 5 – Federal Government Net Fiscal Impact, 1968-1971**  
Contractionary (+) or Expansionary (–)  
(As a percent of potential GNP)



Note: The net fiscal impact measures the year-to-year change in the relative full-employment surplus shown in Chart 4.

Source: Based on data published by Statistics Canada and estimates by Department of Treasury and Economics.

selected urban centres, including metropolitan Toronto. In addition, it included a provision for the implementation of consumer credit controls. In the first-quarter of 1970 the volume of consumer credit outstanding actually declined, however, and this provision was subsequently dropped. This budget, although forecasting a small reduction in the budgetary surplus from \$355 million in fiscal 1969-70 to \$300 million in fiscal 1970-71, was clearly not intended as an expansionary budget.

The weight of financial policy in the first months of 1970 was also firmly directed toward reducing inflationary pressures. The Governor of the Bank of Canada, in his annual report for 1969, stated, "... at the present time inflation is the foremost economic problem of the country as a whole".<sup>14</sup> By the first quarter of 1970, however, it had become obvious that a general slowdown in the economy was occurring. Major weaknesses had developed in output and employment, and the prospect of a significant rise in the external value of the Canadian dollar added a further blow to the outlook.

<sup>11</sup>All references to total cash requirements will be exclusive of cash required for foreign exchange transactions.

<sup>12</sup>Hon. Edgar J. Benson, Budget Speech, (Ottawa: March 12, 1970).

<sup>13</sup>For the purposes of this paper, the original surplus of \$250 million for 1970-71 has been adjusted upwards by \$50 million due to the non-implementation of consumer credit controls. Therefore, the following discussion proceeds on

the basis that the March 12 budget surplus was \$300 million.

<sup>14</sup>L. Rasminsky, Bank of Canada Annual Report for the Year 1969, (Ottawa: February 28, 1970), p. 9.



**Table I — Government of Canada Financial Position, Fiscal 1970-71 and 1971-72**  
(billions of dollars)

	1970-71				1971-72		
	Mar.	Oct.	Dec.	Final	Dec.	Jun.	Oct.
	12/70	13/70	3/70		3/70	18/71	14/71
	Forecast	Forecast	Forecast		Forecast	Forecast	Forecast
Budgetary Transactions:							
Revenues	13,200*	13,100	13,035	12,803	n.a.	13,660	13,580
Expenditures	12,900	13,250	13,355	13,182	n.a.	14,410	14,580
Surplus (+) or Deficit (—)	+300	—150	—320	—378		—750	—1,000
Non-budgetary Deficit (—)	—775	—1,185	—1,250	—804	n.a.	—1,680	—1,600
Total Cash Requirements (—) (excluding requirements for foreign exchange transactions)	—475	—1,335	—1,570	—1,182	—2,100	—2,430	—2,600

Source: Receiver General for Canada, Public Accounts of Canada, Volume 1, and budget speeches.

\*Adjusted for the non-imposition of consumer credit controls.

The original forecast estimated a \$50 million revenue loss and a budgetary surplus for 1970-71 of \$250 million.

Figures may not add due to rounding.

#### Revisions to Federal Fiscal Position for 1970-71

To expand its fiscal impact on the economy, the federal government introduced a stream of increases in budgetary and non-budgetary expenditures in June, October and December of 1970, but no reductions in taxes occurred. The June measures<sup>15</sup> included the following major items: increased equalization payments (\$100 million); accelerated tax collection payments to the provinces (\$150 million); an increase in the CMHC budget (\$100 million); and a summer employment program. These measures were supplemented in October<sup>16</sup> by an accelerated disbursement of funds under the Technical and Vocational Training Schools Program (\$75 million), and an additional expenditure directed specifically at regional unemployment (\$60 million).

As of October 13, 1970, the forecast of budgetary revenues (see Table 1) was reduced by \$100 million due to the automatic influence of the weaker-than-expected performance of the economy on incomes and hence tax revenues. Budgetary expenditures, on the other hand, were increased by \$350

million, producing a prospective deficit of \$150 million for the year instead of the surplus of \$300 million forecast in March. There was also an increase in net non-budgetary requirements of \$410 million.

The increase in total cash requirements from March to October was \$860 million, compared with original requirements for the year as a whole of \$475 million. Consequently, as shown in the table, total planned cash requirements for the year rose to \$1,335 million. With the exception of: (i) the automatic reduction in revenues to the tune of \$100 million, (ii) exchange fund profits of \$140 million, and (iii) the automatic increases in expenditures due to higher than forecast unemployment and welfare case loads, the planned increase in cash requirements of \$860 million was substantially discretionary (amounting to something less than \$600 million) and was a direct policy response to the deteriorating economic situation.

Toward the end of the year, the federal government began emphasizing the *adaptability* of federal fiscal policy: that is, the desirability of introducing changes to bud-

gets whenever appropriate rather than simply at the start of the fiscal year. And, on December 3, 1970,<sup>17</sup> still further expansionary measures were introduced including: a \$150 million loan fund to the provinces; additional spending by government departments and agencies on capital improvements (\$23 million); an increase in the capital budget of CMHC (\$40 million); supplementary unemployment insurance benefits from January to June, 1971, and a capital cost allowance incentive to businesses engaged in manufacturing and processing.

However, taxes were kept at previous levels by *extending the surtaxes on personal and corporate incomes through 1971*. This change added about \$61 million<sup>18</sup> to tax revenues in the last quarter of the fiscal year. Nevertheless, revenues were now estimated at about \$165 million below the original budget due to a further revision since October of the expected performance of the economy. In effect, the total automatic adjustment in revenues amounted to \$226 million. Of the total increase in planned cash requirements of \$235 million since October (see Table 1), probably no more than about \$100 million was due to discretionary increases in spending. The total planned net infusion of additional funds between March and December thus amounted to around \$700 million.

In the final analysis, however, budgetary revenues and expenditures for fiscal 1970-71 were both lower than estimated in December, 1970. Revenues turned out to be \$397 million below the original March forecast despite the extension of the surtaxes which, as noted previously, added about \$61 million. Therefore, the total automatic influence of the economy's poor performance on the original budget revenue plan was around \$450 million.<sup>19</sup> Also, there were evidently considerable delays in implementing changes on the expenditure side. Budgetary expenditures for the year turned out to be lower than even the October estimates and non-budgetary requirements, which in December were estimated at almost \$500 million above the March forecast, were only marginally higher in the final analysis than originally anticipated. There is no satisfactory official explanation for these substantially reduced levels of actual compared with intended spending. The explanation offered by the federal Minister of Finance, Mr. Benson, in his June 18, 1971 Budget speech is:

<sup>15</sup>Hon. Edgar J. Benson, Report to the House of Commons on the Federal-Provincial Conference, June 5-6, Winnipeg, (Ottawa: Department of Finance, June 8, 1970).

<sup>16</sup>Hon. Edgar J. Benson, Statement on Economic Policy, (Ottawa: Department of Finance, October 13, 1970).

<sup>17</sup>Hon. Edgar J. Benson, Budget Speech, (Ottawa: December 3, 1970).

"Whether certain payments will fall into one fiscal year or the next is always subject to some uncertainty as the calendar is rigid, but the progress of payments in relation to on-going and expanding programs is less rigid. The increase in our total cash requirements was some \$500 million less than I indicated in my budget of last December because of such factors. In respect to some categories of spending these differences were fairly large, but there were offsetting changes in respect of others. The impact of the economic programs of the government upon the economy was not, however, materially affected by these rather technical matters of timing."<sup>20</sup>

In conclusion, although the introduction of substantial in-year increases in forecast expenditures and total cash requirements gave the impression of an increasingly expansionary thrust during fiscal 1970-71, the actual outcome resulted in a relatively minor discretionary increase in total cash outlays. Of the actual increase in cash requirements over the original budget of \$707 million (\$1,182 million less \$475 million), over half of the increase was absorbed by the automatic \$450 million revenue loss and part of the balance would inevitably have been taken up by the automatic increase in expenditures to cover higher than expected levels of unemployment. Consequently, the 'adaptability'

<sup>18</sup>The figure of \$61 million represents one-quarter of the total estimated revenues from the surtaxes in 1971. However, because of the timing of collections, particularly in the corporation tax, the final figures for the last quarter of fiscal 1970-71 may be somewhat less.

<sup>19</sup>It is interesting to note that the lower level of revenues occurred despite the fact that the federal forecast of the economy's overall performance does not appear to have been all that bad. Mr. Benson forecast in his March budget that real growth would be in the neighbourhood of 3.0 per cent in 1970 with the rate of price inflation slightly less than the year before. In fact, real growth in 1970 turned out to be 3.3 per cent and the rate of price inflation was 4.1 per cent compared with 4.7 per cent in 1969. Despite this relatively correct overall forecast, personal income tax revenues increased by only \$612 million in 1970-71 compared with the original forecast of \$1,205 million, and, corporate income tax revenues declined by \$393 million compared with the forecasted decline of \$132 million. Partially offsetting this approximately \$850 million shortfall in income tax revenues was a \$530 million unforecast gain in other revenue categories.

<sup>20</sup>Hon. J. Edgar Benson, Budget Speech, (Ottawa: June 18, 1971).

of federal fiscal policy in fiscal 1970-71 was limited to changes in *intended* levels of revenues and expenditures and, because of a long implementation lag, *it lacked the flexibility to bring about a significant economic impact in the short run.*

#### Original Federal Fiscal Program for 1971-72

The federal fiscal plan for 1971-72 has shown a similar tendency to planned in-year expansion in 1970-71 (see Table 1).

The first estimate for the fiscal year was revealed in the December 3, 1970 budget which stated that overall cash requirements for the year would be \$2,100 million. No further details were given at that time. This amount represented a planned increase of \$530 million over the figure of \$1,570 million then forecast for fiscal 1970-71. However, since the final cash requirements for 1970-71 were \$1,182 million, and cash requirements for 1971-72 in fact increased in June and October, a substantial carry-over of unrealized 1970-71 spending intentions into 1971-72 has occurred.

The June 18, 1971 budget<sup>21</sup> gives the first detailed presentation of the fiscal plan for 1971-72. A budgetary deficit of \$750 million was forecast, net non-budgetary requirements were expected to total \$1,680 million, and total cash requirements thus were forecast at \$2,430 million. This forecast figure was \$1,248 million higher than actual requirements for the previous fiscal year. About one-third of this increase is accounted for by the large carry-over of unrealized 1970-71 spending intentions.

In contrast to budgetary developments during 1970-71, which were designed to expand public rather than private spending, the June budget introduced measures principally to encourage confidence and spending in the private sector of the economy. Among these measures were removal of the personal and corporate income surtaxes and extension of tax relief at lower income levels (for a total infusion of funds to the private sector of \$175 million), reductions in the excise tax on radio and television sets, etc. (\$40 million), and withdrawal of the sales tax on anti-pollution equipment and margarine (\$15 million). Undoubtedly the experience of fiscal 1970-71, i.e. continued rising unemployment, has suggested to the federal government that primary reliance on planned increases in public spending, particularly in arm's length categories, is not an effective way of stimulating the economy in the short term.

<sup>21</sup>Hon. Edgar J. Benson, Budget Speech, (Ottawa: June 18, 1971).

#### Revisions to Federal Fiscal Policy Program for 1971-72

The October 14, 1971 "emergency" budget<sup>22</sup> was intended to reinforce the thrust of the June budget. A program consisting of a series of expenditure increases and tax cuts was proposed. Expenditures and disbursements were increased by approximately \$500 million with the introduction of the following measures: a \$100 million Local Initiatives Program; an expansion of Canada Manpower Training Programs (\$35 million); the establishment of another \$160 million Special Development Loan Fund to the provinces; acceleration in CMHC loans (\$113 million); and an expansion of federal capital works projects (\$80 million). The tax cuts consisted of a temporary 7.0 per cent reduction in the federal corporate income tax, and a temporary 3.0 per cent cut in the federal personal income tax, both effective July 1, 1971 until the end of 1972. The corporate tax cut is expected to cost the federal government \$160 million in revenues in fiscal 1971-72 and the cut in personal taxes a further \$100 million in the same period.

These emergency measures have increased the planned budgetary deficit by \$250 million from the June forecast, to a total of \$1 billion for 1971-72, and total cash requirements from \$2,430 million to \$2,600 million. Total revenues for fiscal 1971-72 are forecast only \$80 million lower than the earlier June estimate despite the \$285 million tax cut. Actual revenues have been considerably more buoyant than anticipated in previous budget forecasts.

All in all, planned total cash requirements for 1971-72 have increased by \$500 million over the December 3, 1970 estimate of \$2,100 million. The forecast of revenues increased by over \$200 million due to better than expected performance of the economy. Consequently, the total planned increase since December, 1970 in the discretionary fiscal thrust for 1971-72 is around \$700 million. In fact, the carry-over of unrealized 1970-71 spending intentions compounds this thrust considerably to an amount of well over \$1 billion. Thus, the fiscal impact in 1971-72 will be substantially larger than that in 1970-71 provided there is a large carry-over into 1972-73. Some carry-over is, of course, inevitable, particularly since there is still considerable emphasis on expenditure packages similar to those introduced around the same time last year.

<sup>22</sup>Hon. Edgar J. Benson, Statement to the House of Commons (Ottawa: Department of Finance, October 14, 1971).



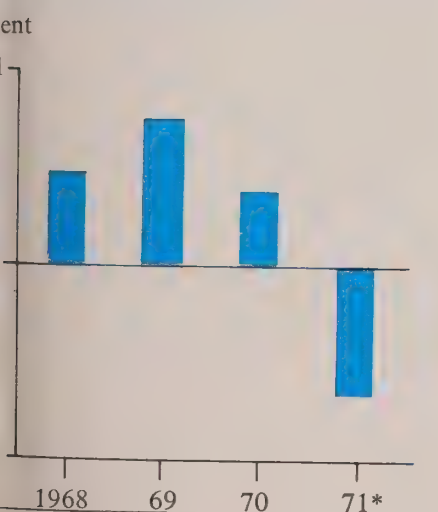
In conclusion, federal fiscal policy in 1971-72 has again shown the adaptability demonstrated in 1970-71. However, despite the use of tax reductions this year (the actual cash benefit of which will in any case be delayed until late in the fiscal year) in addition to expenditure increases, the degree of flexibility in the 1971-72 fiscal program remains to be demonstrated.

#### Ontario Budgetary Developments in 1970 and 1971

##### Employment Budget Estimates

The fiscal impact of the Ontario Government has become firmly expansionary in 1971, reinforcing the more moderate expansionary stance of 1970. Chart 6 shows that the employment budget surplus on a national basis, measured as a percentage of potential GPP, declined in 1970 and 1971, after rising over the previous two years. The positive net fiscal impact shown in Chart 7, which is simply the year-to-year change in the full-employment surpluses shown in Chart 6, clearly demonstrates that the expansionary swing of 1970 and 1971 in relation to the previous years is twice that of the contractionary swing of 1968 and 1969.

#### Chart 6 – Government of Ontario Employment Surplus, 1968-1971 (As a percent of potential GPP)

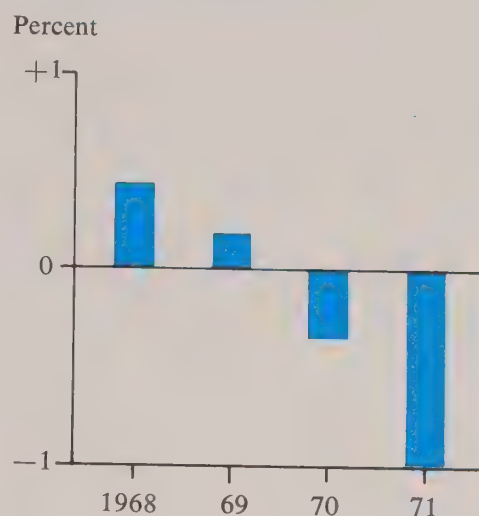


\*Estimated as at December 13, 1971.

Full employment is defined for purposes of this analysis as the level of employment associated with 3.0 per cent unemployment. The operating concept employed is the national accounts budget and both revenues and expenditures are adjusted to their employment levels.

Source: Estimated by Department of Treasury and Economics.

#### Chart 7 – Government of Ontario Net Fiscal Impact, 1968-1971 (As a percent of potential GPP)



Note: The net fiscal impact measures the year-to-year change in the relative full-employment surplus shown in Chart 6.

Source: Estimated by Department of Treasury and Economics.

A comparison of the federal net fiscal impact relative to potential GNP for Canada and the provincial net fiscal impact relative to potential GPP for Ontario, reveals that the recent expansionary thrusts of the two levels of government in their respective economies have been of roughly the same relative order of magnitude. This point underscores once again the importance of provincial fiscal policy in the Ontario economy.

#### Budget Plans versus Realizations

Table 2 summarizes the changes in the financial position of the Ontario Government for fiscal 1970-71 and sets out the original and latest revised forecast for the current fiscal year.<sup>23</sup>

#### Original Ontario Fiscal Program for 1970-71

The Ontario fiscal plan for 1970, as presented in the March 31, 1970 budget,<sup>24</sup> was designed to provide a moderate expansionary stimulus to the economy. The inevitable slowdown in growth and employment under the weight of federal policies of restraint was recognized at that time, and the budget stated that any further restraint upon the economy would be excessive and contribute little to reducing the inflationary pressures. It was felt that such a fiscal program was appropriate in the face of an uncertain economic environment. The Ontario Government stated at that time that should the economic outlook deteriorate, policies would be quickly adjusted. This approach of creating a moderate stimulus stands in contrast to that outlined in the federal budget of March 1970, which, as noted previously, was aimed at strengthening the federal policy of restraint by introducing consumer credit controls and extending the deferral of capital cost allowances.

The moderate expansionary stimulus in the original Ontario budget plan was achieved by a combination of expenditure increases and tax cuts. The budgetary surplus was forecast at \$11 million, compared with a surplus of \$52 million in the previous year. The non-budgetary surplus was forecast at

Table II – Government of Ontario Financial Position, Fiscal 1970-71 and 1971-72 (Millions of dollars)

	1970-71		1971-72	
	Mar. 31/70 Forecast	Final	Apr. 26/71 Forecast	Dec. 13/71 Forecast
<b>Budgetary Transactions:</b>				
Net General Revenues	3,739	3,752	3,847	3,883
Net General Expenditures	3,728	3,846	4,262	4,436
Surplus (+) or Deficit (-)	11	-94	-415	-553
Net Non-budgetary Surplus (+) or Deficit (-)	63	152	71	194
Total Cash Surplus (+) or Requirements (-)	74	58	-344	-359

Source: Department of Treasury and Economics.

<sup>23</sup>As at December 13, 1971. See, Hon. W. Darcy McKeough, Introduction to Supplementary Estimates.

<sup>24</sup>Hon. Charles MacNaughton, Ontario Budget 1970, (Toronto: Department of Treasury and Economics).

\$63 million, down sharply from \$283 million in 1969-70. The net flow of funds from budgetary and non-budgetary transactions combined was thus estimated at \$74 million, a decrease of \$261 million over the previous year.

The main items of the expenditure program included: supplementary tax relief for pensioners with limited incomes (\$10 million); increased financial aid to local governments to extend property tax relief (\$125 million); environmental control measures (\$12 million); establishment of a capital fund under Ontario Housing Corporation Limited (\$50 million), and expansion of insured health services (\$7 million).

Selective tax relief was provided in three areas: succession duties — principally increased exemptions for widows and widowers (at a cost of \$3 million); retail sales taxes — removal of the 5 per cent tax on a number of production tools in order to aid industry to reduce production costs (at a cost of over \$7 million), and accelerated capital cost write-off for water pollution control equipment (at a cost of about \$3 million).

### Revised Ontario Fiscal Program for 1970-71

Table 2 shows that the original Ontario budget program for 1970-71 underwent substantial in-year change as did the March 1970 federal budget. The final figures for the year show that the surplus forecasted on budgetary account of \$11 million became a deficit of \$94 million, representing a swing of \$105 million. The forecast surplus on non-budgetary account of \$63 million increased by \$89 million to \$152 million. These budgetary and non-budgetary changes, being largely offsetting, thus had little impact on the total cash surplus — which at \$58 million remained close to the original forecast.

On the budgetary account both revenues and expenditures were higher than previously anticipated, but only expenditures increased significantly, rising by \$118 million over the original forecast of \$3,728 million. To a large extent the increases in expenditures were discretionary:

"In terms of timing, the expansionary effects of the budget were heavily concentrated in the winter and early spring months, when unemployment was most severe and the government's social policies were of the greatest benefit.<sup>25</sup>

Expenditure increases included: property tax rebates for farmers and additional benefits in the form of property tax reduction grants for pensioners (\$25 million); extended medicare coverage (\$18 million); increased public housing subsidies (\$6 million); accelerated public works, increased vocational school construction and special winter employment programs (for a total of \$21 million); salary increases in the mental health program, and the introduction of a second language program (about \$12 million). In addition, general welfare expenditures increased automatically by about \$11 million due to higher levels of unemployment. Of the total increase in expenditures of \$118 million, approximately \$100 million resulted directly from changes to the original budget plan and thus was of a discretionary nature.

Non-budgetary account changes were also fairly large: receipts and credits were \$59 million above forecast and disbursements and charges \$30 million below forecast, for a net increase in the flow of funds originally anticipated of \$89 million. The increase in receipts was due to a more rapid rate of repayment of loans and advances and higher CPP receipts. The lower level of disbursements and charges reflected a slower than anticipated use of funds available for loans and advances.

These non-budgetary developments undoubtedly reduced the economic impact of the budget below that originally anticipated. Nevertheless, in view of the poor short-term flexibility of many arm's length expenditures, it is significant that *in-year* changes to the Ontario fiscal program were concentrated in the more flexible direct budgetary expenditures. In-year changes to the federal fiscal plan for 1970-71, by contrast, placed almost equal emphasis on increases in budgetary and non-budgetary expenditures. And, it was primarily due to the inflexibility of non-budgetary programs that the federal fiscal impact was very much lower than planned.

### Original Ontario Fiscal Program for 1971-72

The Ontario fiscal plan for 1971-72, presented in the *Ontario Budget 1971*, on April 26, contained measures designed to continue and increase the expansionary thrust of provincial fiscal policy adopted during 1970. The policy design involved stimulating the economy primarily with substantial tax reductions while containing expenditure growth. It was felt that by these means private econo-

mic activity and investment could be increased and employment expanded with stimulating inflationary pressures. This contrasts sharply with that of the federal government which until June relied solely on expenditure increases to stimulate the economy and in fact included, in December 1970, the decision to extend the personal and corporate income surtaxes.

In the original budget plan for 1971 the full-employment budgeting approach was applied, for the first time by any government in Canada, to the design of fiscal policy:

"Full-employment budgeting is particularly relevant to the current economic situation and the problem of fiscal policy co-ordination in the Canadian federal system. Budgetary deficits are commonly understood to be expansionary. However, the full-employment budget adds a new dimension to this conventional approach to fiscal policy formulation. It emphasizes the way in which revenues increase as economic activity revives and exerts a 'drag', thereby slowing down economic expansion, possibly before full employment has been achieved . . . Our plan offsets the slack in the economy by counteracting the federal government's drag in Ontario . . . First, in line with the objective of controlling the growth of the public sector, our expenditures have been held to a level of \$4.26 billion. This closely matches the level of expenditures which would be appropriate for us if the economy were operating at full employment. Second, we have cut taxes in a way which restores the growth potential of our economy. Thus, without any tax cuts, revenues at full employment could be expected to increase to some \$4.17 billion with a resulting deficit of \$80 million. However, by cutting taxes, we will restore the growth potential of revenues at full employment by about \$70 million, for a total of \$4.1 billion, with a resulting deficit of \$150 million. Most importantly, however, the tax cuts in this budget are designed to offset part of the fiscal drag on federal revenue growth as the economy reacts to our planned budgetary deficit of \$415 million for 1971-72."<sup>26</sup>

While the overall level of expenditure was contained, the budget did include increased spending in the following areas: a five per cent increase in the level of financial support

<sup>25</sup>Hon. W. Darcy McKeough, *Ontario Budget 1971*, p. 89.

<sup>26</sup>Hon. W. Darcy McKeough, *Ontario Budget 1971*, pp. 11 and 12.

<sup>27</sup>Hon. W. Darcy McKeough, *Ontario Budget*

<sup>28</sup>These anticipations were subsequently borne out by the results of the Dominion Bureau of Statistics' survey of investment intentions for 1971 which called for a 2.9 per cent increase in capital expenditures on machinery and

cent the year before. Dominion Bureau of Statistics and the Department of Industry, Trade and Commerce, Private and Public Investment in Canada, Outlook 1971, (Ottawa: Information Canada, April, 1971).



l governments re property tax relief (\$78 million); an expansion of summer job opportunities for students (\$17 million); a doubling of the commitment for direct lending in housing; the allocation of funds to provide financial assistance to urban transit systems and to provide aid in environmental control.

Tax reductions, however, represented the new method of directing the fiscal thrust. They were termed, "the key initiative in the budget to stimulate a revival of economic growth and job opportunities in Ontario."<sup>27</sup> The major tax incentive comprised a 5.0 per cent tax credit for investment in machinery and equipment. While this action meant an estimated revenue loss of \$125 million in 1971-72 and an equivalent amount in the following year, it was deemed essential to offset the slowdown anticipated in job-creating investments in new production facilities.<sup>28</sup> It should be noted that, for reasons stated in the budget, a reduction in the personal income tax was not considered to be a realistic alternative. Nevertheless, it is significant that a cut in the personal income tax was thought to be desirable at the time. In the request was also made in the budget that the federal government reduce personal and corporate income taxes on a national basis through elimination of the "temporary" 15 per cent federal surtaxes. This step was actually taken by the federal government in the June, 1971 budget.

### Ontario Fiscal Program for 1971-72

On October 8, Prime Minister Davis announced further Ontario Government policy measures to reinforce the basic fiscal plan introduced in the April budget.<sup>29</sup> These measures, which comprised a two-part plan for economic stimulation, were deemed necessary in view of the lack of any improvement in the unemployment situation in Ontario and the uncertainties caused by the recent economic measures by the United States.

The two-part plan involves the balanced budget with tax reductions and selective expenditure increases. These changes will result, as of December 13,<sup>30</sup> in an increase in the budgetary deficit of \$138 million to a record of \$553 million. Expenditures and revenues are forecast at \$174 million and \$125 million respectively above the April estimates. The surplus on non-budgetary accounts is now forecast at \$194 million, compared with \$71 million in the original budget. Accordingly, total cash requirements to

finance net budgetary and non-budgetary transactions have increased to \$359 million, or \$15 million over the original budget figure of \$344 million.

The increase in budgetary expenditures of \$174 million is mainly discretionary as it includes substantial expenditures under a direct winter employment stimulation program and an acceleration of capital works projects started earlier in the year. In addition, it covers a variety of other discretionary measures detailed in the *Supplementary Estimates*. Only about \$12 million of the increase can be attributed directly to the automatic influence of the economy on the budget, due to the impact on welfare benefit payments of high levels of unemployment.

The increase in the forecast of budgetary revenues of \$36 million has occurred despite a reduction in personal income tax revenues amounting to \$28 million. An upward revision of \$75 million in the forecast of revenues from the corporate income tax is the major factor. This essentially reflects a change in anticipations with respect to the disposition of claims under the corporate investment tax credit scheme between 1971-72 and 1972-73.

In his statement of October 8, the Prime Minister of Ontario called for federal tax reductions to stimulate economic revival. He offered to join the federal government in implementing a cut in personal income taxation, recommending a complementary reduction of the provincial tax. With the federal announcement on October 14, the Ontario personal income tax was in turn reduced. This reduction will take effect in two distinct stages, involving a 3.6 per cent retroactive tax cut for the six-month period July 1, 1971 to December 31, 1971 at a revenue cost of \$22 million, and a 3.0 per cent tax cut for the twelve-month period January 1, 1971 to December 31, 1972, at a revenue cost of \$36 million.

In addition to the personal income tax cuts, the Ontario Government has proceeded with tax actions in three other areas. In September of this year reforms to the health insurance premium system were announced, involving principally abolition of premiums for persons aged 65 and over and for their eligible dependants effective January 1, 1972, and reduction in the total premium levels. This reform is expected to reduce total premium collections by \$127 million annually. The Ontario corporations tax is to be amended to ensure that federal employment support grants will not be taxable in Ontario.

Finally, major changes in succession duties designed to provide substantial relief to all categories of beneficiaries will go into effect on January 1, 1972.

The revision to the forecast of the non-budgetary surplus has followed the same upward pattern as last year, and for similar reasons. Receipts and credits are up \$36 million largely because of higher proceeds from CPP and other non-public debenture issues. Disbursements and charges are reduced by \$87 million mainly because of a slower than expected pick up of funds by various government corporations. On balance, these changes reduce the expansionary impact of the tax cuts and discretionary expenditure increases.

Nevertheless, in comparison with federal fiscal policy in 1971-72 three features of Ontario policy stand out:

- (i) it was based on an objective "full-employment budgeting" assessment of the impact of current policy;
- (ii) it included more emphasis on tax cuts rather than expenditure increases. In addition those increases in expenditures that occurred were mainly direct, rather than arm's length; and
- (iii) the major policy incentives — tax credits and cuts and winter employment expenditure programs — preceded similar federal action.

### III PROBLEMS OF DESIGNING AND IMPLEMENTING SHORT-TERM ECONOMIC STABILIZATION POLICY

The task of short-term economic stabilization is demonstrably very difficult. It is, however, even more complicated in a federal state such as Canada. The Ontario Government has expressed its view in this regard on many occasions,<sup>31</sup> and they will not be reiterated here. Nevertheless, in light of the obvious failure of federal policies to maintain high levels of employment, and in view of the absence of new federal initiatives with respect to federal-provincial fiscal policy co-ordination, it seems important to consider briefly those problems revealed in this paper. These are the problems of lags in the implementation of policy changes, the balance of policy-mix between expenditure changes and tax changes, and the problem of estimating the direction and degree of fiscal impact.

1. William Davis, Ontario's Plan for Economic Stimulation, (*Queen's Park*: October 8, 1971).

2. W. Darcy McKeough, Introduction to Supplementary Estimates.

<sup>31</sup>See for example: Hon. Charles MacNaughton, "The Public Sector and Economic Policy", Ontario Budget 1970; Hon. W. Darcy McKeough, "New Directions in Economic Policy Management in Canada", and

The Reconstruction of Economic and Fiscal Policy Co-ordination in Canada, a statement presented to the Meeting of First Ministers, Ottawa: November 15-16, 1971.



In section II of this paper, it has been argued that federal fiscal policy in the past two years has been far less effective than federal expectations have led us to believe. The basic problem was seen as one of *implementation*, in which the very long lags between decisions and actions were drastically underestimated. Of particular concern is the fact that despite the poor experience of the in-year changes to the expenditure programs in fiscal 1970-71, that route was again chosen to channel the major thrust of federal fiscal policy in 1971-72. Recognition of the importance of tax reductions came later, and only after widespread public prompting.

The Senate Finance Committee<sup>32</sup> has observed the following with respect to the problems of lags (not just those of implementation but of recognition, decision and impact also):

"Recent research indicates that these (time) lags are even longer and more variable than was previously thought. Canadian economic policy has not taken adequate account of lags nor are the existence and significance of lags sufficiently known to Parliament and the general public."<sup>33</sup>

The Ontario Government, in both its 1970 and 1971 budgets, has attempted to maximize the flexibility of its fiscal policy by containing expenditure growth while employing tax cuts as the major discretionary economic stimulus. In addition — and in contrast to federal policy — those in-year revisions to expenditures which have occurred have been mainly direct and not arm's length. Direct expenditures offer a greater degree of short-term flexibility. The Senate Finance Committee has supported greater emphasis on tax changes for short-term economic stabilization:

"The use of fiscal policy should lean more to adjustments in taxes than adjustments in government expenditures. Despite "tax shifting", (the treating of taxes as transferable costs) tax changes remain a highly effective means of stabilizing the economy."<sup>34</sup>

This paper has also emphasized the importance of the concept of full-employment budgeting to fiscal policy formulation. The Ontario Government employed this concept in its 1971 budget design. Once again the Senate Finance Committee has supported such a move:

"The Minister of Finance told us that he discerned some important practical difficulties in applying a high-employment-budgeting rule to the Canadian federal government and he questioned whether the concept would be particularly illuminating to the public or otherwise useful.

We took careful account of the Minister's views on this point. But we could not help observing also that the Ontario government, as well as the United States federal government, has seen virtue in the concept, and that both have found ways of adapting it to their needs. It seems to us that some reasonably flexible adaptation of the concept to the budgeting of the federal government in Canada would also be helpful.

We therefore recommend that the federal government adopt the concept of high-employment-budgeting, at least to the extent of always estimating, in budget presentations, what the budgetary position would be at high employment and of analyzing reasons for changes in the estimated figures since the previous presentation."<sup>35</sup>

The Economic Council of Canada<sup>36</sup> has also made use of the full-employment budget concept in analyzing the economic impact of the government sector in Canada to illustrate that fiscal policy of all levels of government has shifted towards less restraint over the past two years.

## CONCLUSION

The Canadian economy has been performing below potential for the past few years. In 1970, economic growth was particularly weak largely due to the lagged impact of federal policies of restraint adopted late in 1968 and applied throughout 1969 and into the first half of 1970. The original federal program for fiscal 1970-71 was designed to maintain this policy of restraint. Substantial in-year increases in planned expenditures, however, reversed the thrust of fiscal policy to one of expansion. Nevertheless, because of the existence of a long implementation lag, the actual fiscal impact of the revised 1970-71 program fell considerably short of federal expectations. Not only were total cash requirements for the year well below forecast but more than one half of the increase in cash requirements over the previous year was automatically absorbed by the weaker than expected performance of revenues.

Even so, the full-employment budget estimates show that — on a national account basis — the federal fiscal impact was expansionary in 1970, though nowhere nearly sufficient to completely reverse 1969's restrictive impact. In 1971-72, the planned federal expansionary swing is more pronounced partly because of a carry-over into the current fiscal year of unrealized 1970-71 spending intentions. Some carry-over of this year's program into next year appears inevitable, and is thus unlikely that the full planned impact will materialize in 1971-72. However, the tax reductions in this year's program give it more flexibility than last year's, and there seems to be no reason to doubt that this combined expansionary fiscal impact of 1970-71 and 1971-72 is greater than the restrictive impact of 1969.

Ontario fiscal policy for 1970-71 was in contrast to federal policy, designed from the outset to be expansionary, albeit moderately so. It showed the same adaptability as federal policy, undergoing substantial in-year changes intended to reinforce its expansionary thrust. In fact, in terms of the overall cash position, little change occurred during the year, because a larger than expected budgetary surplus offset the significant increase in the budgetary deficit. The full-employment budget estimates show, however, that the national accounts budget had an expansionary impact in 1970. Ontario fiscal policy was more flexible than federal policy because in-year changes in expenditures were concentrated in direct rather than arm's length categories.

The contrast in federal and Ontario budget plans which occurred in 1970-71 also applied in plans for the current fiscal year. The Ontario plan again moved more quickly than the federal program toward expansion with a combination of tax cuts and expenditure increases. The federal program expanded Ontario's, and federal tax cuts came relatively late.

In the past two years, the fiscal impact of the Ontario government in the provincial economy has been almost as pronounced in relative terms, as that of the federal government in the Canadian economy. Accordingly the Ontario budget has become a key economic document insofar as the short-term economic stabilization of the Ontario economy is concerned. This recent evolution of an independent provincial fiscal policy in Ontario underscores the importance of

<sup>32</sup>Hon. Douglas D. Everett and Hon. Hartland de M. Molson, Report of the Standing Senate Committee on National Finance on Growth, Employment and Price Stability, (Ottawa: Information Canada, 1971), page 40.

<sup>33</sup>Senate Finance Committee, Growth, Employment and Price Stability, page 21.

<sup>34</sup>Ibid. page 38.

<sup>35</sup>Ibid. page 38.

<sup>36</sup>Economic Council of Canada, Performance and Potential.



-provincial fiscal policy co-ordination.<sup>37</sup> Over the past two years the direction of most in federal and Ontario fiscal policies has fortunately, been the same, although in terms of the timing of major initiatives Ontario has tended to move first. However, independent pursuit of contrary policies is a

possibility in the future given existing evidence of lack of co-ordination. This year, for example, in the absence of federal plans for dealing with winter employment problems, the Ontario government went ahead with its own program. Subsequently, the federal government instituted its program which

overlaps the Ontario program in certain areas. Such duplication limits the efficiency and flexibility of fiscal policy in Ontario. There is little doubt that the utilization of federal-provincial fiscal resources could be made more efficient through co-ordinated policies.

*In this regard it should be noted that the Ontario government has suggested the establishment of a Joint Economic Committee composed of federal and provincial Ministers of Finance*

*to annually review economic performance and set economic targets for the future. Agreement on this matter has been reached in principle. See Hon. William Davis, An Economic Strategy*

*for Ontario, (Ottawa, October 14, 1971), and Hon. W. Darcy McKeough, Introduction to Supplementary Estimates.*

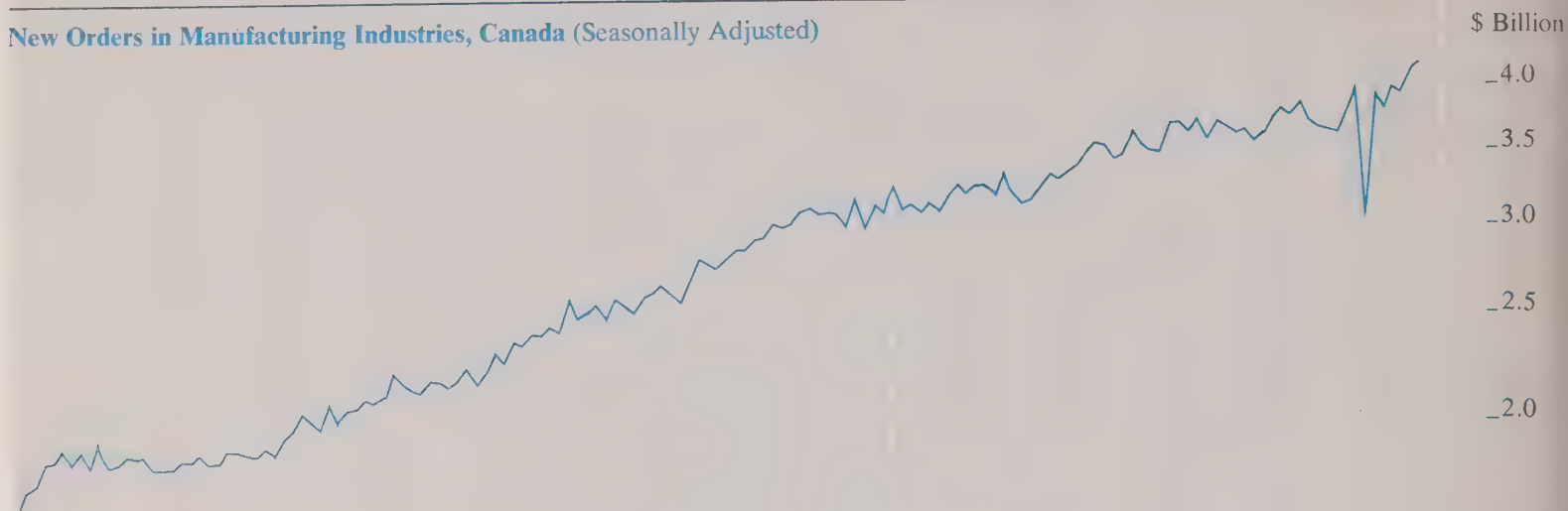
# Selected Economic Indicators

## Leading Indicators

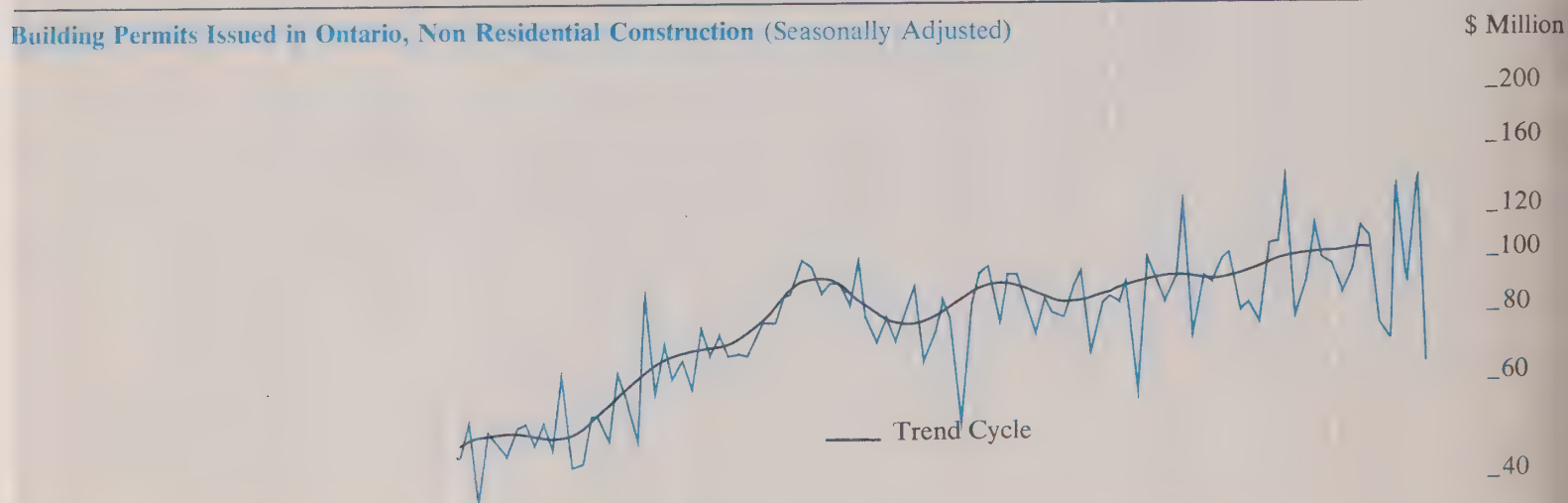
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



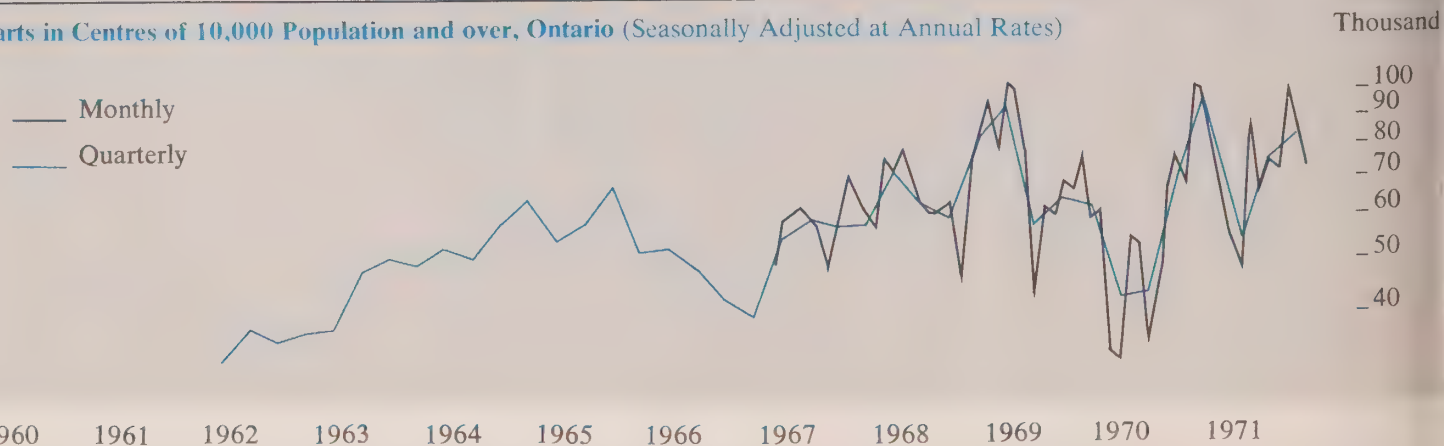
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971



## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

\$ Billion  
Scale L1  
\_35  
\_30  
\_25  
\_20  
\_15

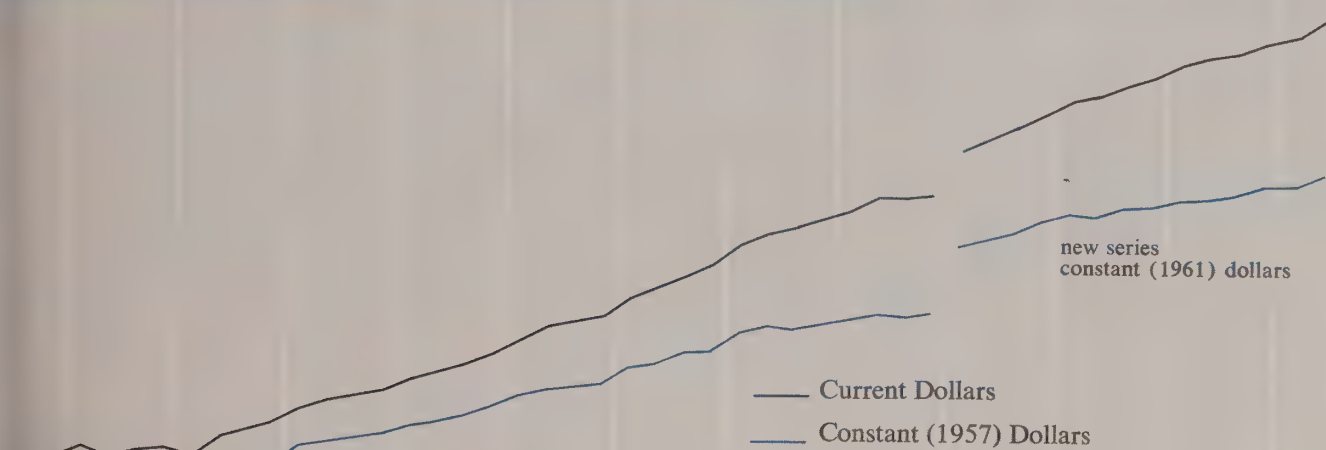
**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Index  
Scale L2  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

## Coincidental and Lagging Indicators

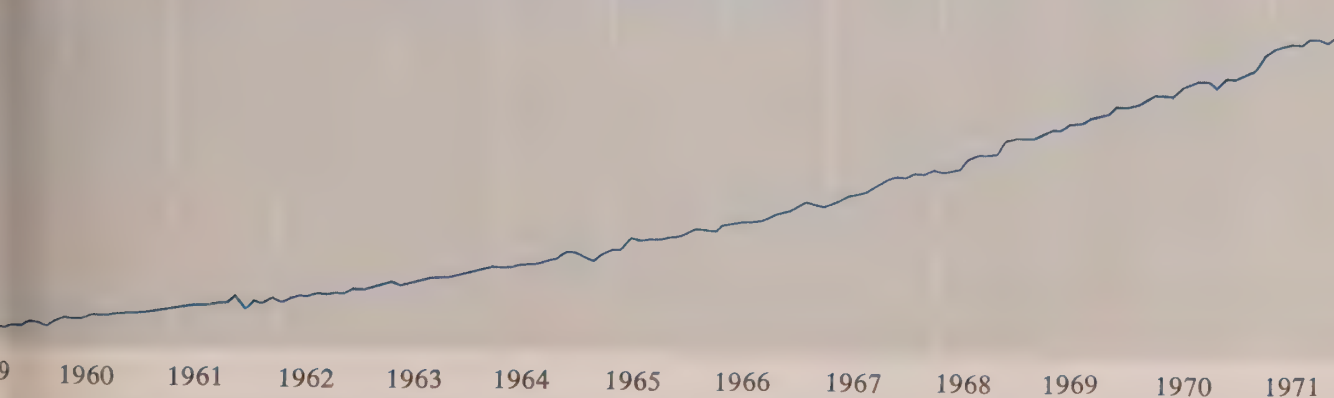
**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion  
Scale L1  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Dollars  
Scale L1  
\_3.50  
\_3.00  
\_2.50  
\_2.00



1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971

# Coincidental and Lagging Indicators





Leading Indicators	1971														
	1970	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.
Average Weekly Hours Worked in Manufacturing		39.6	39.5	39.4	40.1	39.2	38.8	39.3	39.9	39.2	40.0	39.8	39.8	39.9	
New Orders in Manufacturing Industries <sup>c</sup>		3,754	3,697	3,689	3,686	3,885	4,034	3,097	3,975	3,961	4,130	3,994	4,267	4,335	4,264
Building Permits Issued in Ontario, Non-Residential Construction		120.3	103.1	100.0	90.6	97.0	117.5	112.0	77.1	73.3	138.1	91.5	142.6	66.9	
Urban Housing Starts (Annual Rate)		69,200	106,000	103,800	82,300	60,600	55,600	48,400	88,000	67,900	75,000	73,000	99,400	82,900	73,600
Money Supply <sup>c</sup>		30,194	30,624	31,197	31,696	32,135	32,511	33,144	33,495	34,292	34,896	35,016	35,393	35,949	
T.S.E. Industrial Index <sup>u</sup>		165.8	162.1	168.7	174.4	178.1	177.4	185.3	181.6	177.8	180.7	177.5	176.3	169.88	160.82
Business Failures <sup>u</sup>		55	71	74	71	71	70	100	81	88	66	60	55	40	78
Business Failures — Liabilities <sup>u</sup>		5.3	8.1	5.8	7.7	11.6	4.5	5.2	3.8	3.4	5.3	8.0	5.3	2.1	5.6
Coincidental and Lagging Indicators															
Gross National Product <sup>c</sup> (Annual Rate)		84,988			86,376			88,372			91,392			93,676	
Average Hourly Earnings in Manufacturing		3.18	3.21	3.22	3.33	3.37	3.40	3.43	3.43	3.45	3.45	3.46	3.47	3.49	
3-Month Treasury Bill Rate <sup>c,u</sup>		5.39	5.01	4.40	4.44	4.68	4.06	3.16	3.00	3.03	3.37	3.68	3.79	4.06	3.98
Cheques Cashed in Clearing Centres <sup>1</sup>		7,184	6,945	6,475	6,553	6,589	7,190	7,956	7,519	7,062	7,110	7,457	7,843	7,988	
Retail Trade		930	896	903	910	900	941	947	995	992	989	983	972	1,000	1,001
Labour Force		3,145	3,166	3,167	3,151	3,215	3,223	3,197	3,207	3,232	3,231	3,230	3,232	3,288	3,306
Employed		3,003	3,030	3,020	2,996	3,042	3,054	3,040	3,023	3,052	3,067	3,083	3,071	3,105	3,120
Unemployed		158	147	156	162	173	169	157	184	180	164	147	161	183	186
Unemployed as % of Labour Force		5.0	4.6	4.9	5.1	5.4	5.2	4.9	5.7	5.6	5.1	4.6	5.0	5.6	5.6
Wages and Salaries		1,596	1,600	1,611	1,618	1,628	1,668	1,673	1,693	1,721	1,730				
Index of Industrial Employment		130.2	130.0	129.7	132.0	131.5	132.2	131.7	131.5	132.7	133.8	132.5	132.6	133.1	
Index of Industrial Production <sup>c</sup>		169.1	168.6	171.5	170.5	171.7	172.9	172.5	171.2	174.7	175.7	176.3	179.1	179.7	
Total Manufacturing <sup>c</sup>		163.1	164.3	165.5	165.1	167.1	169.0	168.3	167.5	171.2	172.0	171.9	174.7	175.1	
Non-Durables <sup>c</sup>		152.2	152.0	155.3	152.9	152.7	150.3	150.5	150.1	154.1	155.1	154.7	156.0	157.1	
Durables <sup>c</sup>		176.4	179.9	178.4	180.6	185.3	192.7	190.9	189.4	192.8	193.5	193.7	198.4	198.0	
Mining <sup>c</sup>		178.2	175.4	186.7	180.9	177.4	176.0	176.6	174.4	179.3	180.6	184.0	184.7	185.2	
Electric Power and Gas Utilities <sup>c</sup>		208.4	195.0	194.8	201.0	203.2	201.9	202.2	198.5	197.4	198.6	202.1	207.8	210.0	
Primary Energy Demand (Annual Rate)		66.80	65.56	64.32	66.79	67.62	67.76	68.14	67.21	65.74	67.86	67.33	69.82	71.13	68.06
Exports (including re-exports) <sup>c</sup>		1,391.3	1,416.0	1,479.8	1,312.0	1,442.0	1,395.0	1,506.0	1,397.0	1,463.6	1,550.0	1,457.0	1,524.0	1,526.0	1,556.6
Imports <sup>c</sup>		1,184.5	1,006.0	1,138.0	1,020.0	1,128.0	1,181.4	1,338.8	1,181.2	1,279.9	1,344.0	1,321.0	1,387.0	1,284.0	1,466.7
Unclassified Indicators															
Foreign Exchange Reserves <sup>c,u</sup>		3,785	3,831	3,871	3,813	3,816	3,868	3,944	3,962	3,998	3,977	4,056	4,319	4,308	
Industrial Materials Price Index <sup>c,u</sup>		269.2	267.4	266.4	264.2	264.2	266.0	266.4	267.6	267.1	267.4	266.6	267.4	267.1	266.9
Consumer Price Index <sup>c,u</sup>		130.2	130.3	130.3	129.8	130.3	130.9	131.3	132.2	132.7	133.0	134.1	135.0	134.7	134.9
Toronto <sup>u</sup>		127.3	127.1	127.3	126.1	126.7	127.2	127.7	128.3	129.2	129.5	130.2	130.6	130.7	130.2
Ottawa <sup>u</sup>		127.7	127.5	127.6	127.2	127.5	128.3	129.0	129.7	130.5	130.9	131.8	132.0	131.7	131.6
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>		—	—	—	—	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.74	0.74	0.74

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.







# Ontario Economic Review

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Department of Treasury and Economics

Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

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Volume 10, Number 1

## The Ontario Economy

### The Input-Output Structure of The Niagara Region Selected Economic Indicators

S. M. Batrik, *Economist*  
Department of Treasury and Economics

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and Economics  
Government of Ontario

Hon. W. Darcy McKeough  
*Treasurer of Ontario and  
Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Economic and Statistical Services Division, Department of Treasury and Economics. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Department.

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#### About the Review

The January/February edition of the *Ontario Economic Review* presents an article on the recently completed input-output table for the Niagara Region of the Province of Ontario. The table portrays the regional economic structure in terms of interindustry flows of goods and services and their interrelation with the final demand sector. The study also examines the extent to which this regional model can improve our analytical capability for economic forecasting and identifying key productive sectors at the regional level.

The first part of this article outlines the conceptual framework of the Niagara input-output model and provides a concise exposition of the underlying methodology. In the second part, an attempt was made to apply the regional input-output model to estimate the regional income multipliers for different sectors and their effects in terms of income generation. The three basic tables — the transactions flow table, the direct requirements table and the total requirements table — are examined and presented in tabular form in the Appendix. The final section provides a summary of the statistical data sources and estimating procedures used in the construction of the model.

This article was prepared by Mr. S. M. Batrik of the Economic Analysis Branch of the Economic and Statistical Services Division.

The Ontario and Canada economic review of 1971 and forecast for 1972 was prepared by the Economic Planning Branch, Policy Planning Division, Department of Treasury and Economics.

#### Indicator Charts, Pages 40-42

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some may change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 40-42 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## CANADA — 1971 IN PERSPECTIVE

Canada, the focus of economic policy in 1971 shifted towards the creation of additional jobs. Evidence of this was seen in the expansionary June 18 federal budget which was intended to stimulate the economy by lowering the personal and corporate 3 per cent surtax, lowering other taxes to pensioners and removing, through the introduction of the tax reform bill, some of the uncertainty that had plagued the business community since the release of the White Paper on Tax Reform in the fall of 1969. With a relatively strong growth in GNP in the first two quarters, following from a strong recovery in consumer spending, rising exports, and a buoyant construction sector, a mood of cautious optimism greeted the economy at mid-year.

This optimism was short-lived, as on August 15, President Nixon unveiled a set of economic measures designed to restore the ailing U.S. economy to its potential. The Nixon package immediately re-introduced a state of uncertainty and pessimism throughout the economy. The uncertainty was reinforced by concerted efforts by Congress to bring about speedy passage of the Domestic International Sales Corporation (DISC) Act and the Job Development Tax Credit (JDTA) plan, both of which would have serious effects on the Canadian economy in the long run. In addition, discretionary powers granted President Nixon to impose further import curbs and to levy a special 10 per cent excise tax on Canadian-made cars further aggravated an unhealthy situation.

The federal government, realizing that additional firm action was necessary to keep the economy from losing its momentum, introduced further expansionary measures on September 14. Besides increasing government spending through extensive winter works programs, personal tax rates were cut 3 per cent to bolster consumer spending and corporation taxes were lowered by 7 per cent to provide corporations with an opportunity to expand their operations and create much needed jobs.

The programs aimed at expanding the economy were only partially successful. It is estimated that growth of GNP reached 9.1 per cent in 1971, despite Mr. Nixon's measures, and in the last half of the year while consumer spending was very buoyant in 1971. Against this background of growth, however, employment continued to climb and rose to the highest levels in over ten years, with

the result that an average 6.4 per cent of Canada's labour force was out of work in 1971. While some of this increase could be attributed to an extraordinarily rapid growth in the labour force and some paring of personnel by many employers, the federal government's measures were not immediately adequate to meet the employment demands of the country. It was also disappointing that manufacturing operations, which have a high labour content, remained very sluggish throughout the year, while other sectors, not so labour-intensive, surged ahead.

Business confidence received a welcome stimulus on December 18, 1971 when the U.S. removed the 10 per cent surcharge and the Group of Ten countries agreed on a general international currency realignment. It was also agreed that Canada would continue negotiations with the U.S. on trade matters that have been of concern to the U.S., such as the Auto Pact, Canadian purchases under defense purchase agreements and the smallness of the duty-free allowance received by Canadian tourists returning from the U.S.

In general, 1972 began with renewed optimism and economic vigour.

## CANADA — OUTLOOK IN 1972

The recovery of the Canadian economy, well underway in 1971, will continue throughout

1972, as total real output of all goods and services is expected to increase by 6.3 per cent. This is more than one per cent above the average compound growth rate over the period 1965-70.

The momentum of consumer spending should continue through 1972, since disposable incomes will be increased by the 3 per cent tax reduction which took effect on January 1, 1972 and by higher unemployment insurance benefits and increased family allowances and increased employment. In total, a 9.5 per cent increase in consumer spending on goods and services is expected for 1972.

Capital expenditures by business and governments will probably not increase as much as in 1971. A slowdown in the rate of growth in the residential construction sector, which enjoyed a record year in 1971, will be the main factor in the decline from 10.6 per cent growth in 1971 to 7.8 per cent in 1972. With the anticipated rapid growth of the U.S. economy, the removal of the surcharge and the upward valuation of European currencies, exports should increase by about 9.0 per cent in 1972 compared to 6.5 per cent in 1971. On the other hand, sizable increases in disposable income of Canadians will make foreign goods more attractive, so imports are expected to rise 12.0 per cent this year.

A summary of the forecast for Canada on a National Accounts basis is given below.

### Gross National Product — Canada (\$ millions)

	1970	1971	1972	1971/70	1972/71
		Est.	Forecast	Per Cent	Change
Personal expenditure on consumer goods and services	48,995	53,356	58,425	8.9	9.5
Government current expenditure on goods and services	15,802	17,888	20,320	13.2	13.6
Gross fixed capital formation	17,961	19,865	21,405	10.6	7.8
Value of physical change in inventories	122	100	800	—	—
Exports of goods and services	20,969	22,332	24,341	6.5	9.0
Imports of goods and services	19,833	21,915	24,545	10.5	12.0
Gross National Expenditure at Market Prices	84,468	92,126	101,246	9.1	9.9
Implicit Price Index (1961 = 100)	133.6	137.7	142.4	3.1	3.4
Gross National Expenditure at Constant 1961 Dollars	63,210	66,903	71,100	5.8	6.3

Source: Statistics Canada, National Income and Expenditure Accounts, Third Quarter 1971.  
Estimates and Forecast by Economic Planning Branch, Department of Treasury and Economics.

## THE ONTARIO ECONOMY IN 1972

The Ontario economy has recovered substantially from a low point in late 1970. The provincial government led the way by introducing, in the spring budget of 1971, a 5 per cent tax credit on machinery and equipment, and subsequently matched the federal government tax cuts of October 14 by cutting Ontario's share of the personal income tax by 3 per cent. In addition, it stimulated the economy through large outlays on public housing and supplemented the federal winter works program by one of its own.

During 1971, Ontario's labour force grew at an unusually rapid rate and as a result, while employment increased by approximately 83,000 or 2.8 per cent from 1970, the unemployment rate remained at an unacceptable 5.2 per cent. It is expected that unemployment will improve steadily in 1972 and will reach 5.0 per cent for the year as a whole.

It is anticipated that the U.S. economy will recover strongly after a sluggish performance in 1971. This resurgence of activity in the U.S. will have a strong stimulating effect on the Ontario economy through increased exports.

While it is highly probable that retail sales in Ontario as in the rest of Canada will be buoyant, indications are that total investment in Ontario will be below the national average. This will result from a slowdown in residential construction, and from the regional policies of the federal government designed to stimulate investment more in other parts of Canada.

In total, growth of gross provincial product will be 9.9 per cent in 1972 compared to 9.0

per cent in 1971. After discounting price increases of 3.4 per cent, real growth will be 6.3 per cent compared to 5.7 per cent in 1971.

While it is expected that overall growth of the Ontario economy will be similar to that of Canada as a whole, differences between various sectors will occur. For example, while it is anticipated that increases in manufacturing and exports will be greater in Ontario than in Canada, increases in government spending and investment will be lower in Ontario. The net effect of these differences will be similar overall growth patterns in Ontario and Canada.

### Consumer Demand

Despite a relatively slow start at the beginning of 1971, expenditures by consumers on goods and services contributed strongly to the economic growth of the province. Buoyed by a remarkable surge at year's end, retail sales in Ontario in 1971 were approximately 9 per cent above levels attained in 1970.

Statistics for the first nine months of 1971 show the largest increases were recorded by automobile dealers, women's clothing stores, furniture dealers, and department stores, while food, grocery and drug stores registered only nominal gains.

Automobile sales were up mainly because of a backlog of demand from late 1970 and an anticipation of price increases in the later part of the year.

Sales of women's clothing which increased by 12.6 per cent were primarily due to stabilizing of women's fashions.

Furniture, T.V., radio and appliance stores, spurred on by a record number of

housing completions, also saw very active activity as their sales in the first nine months of 1971 increased 9.1 per cent over the period in 1970.

On the other hand, food stores, under the influence of prolonged price wars had increases in sales of only 0.5 per cent.

In comparison with 1970, when total sales grew only enough to cover price increases, 1971 was an excellent year for retailers; after price increases are discounted, total volume of retail sales increased by 5.8 per cent and it is expected that spending in 1972 will increase by a further 8.5 to 9 per cent. Consumers will be encouraged by higher disposable incomes due to the removal of the 3 per cent surtax and a further 3 per cent tax cut announced in the October 14 mini-budget, increased transfer payments from higher unemployment insurance benefits and family allowances, many escalation clauses in existing labour contracts as well as increasing employment. A further expansion in consumer spending which seems most likely in 1972, will help bolster retail sales.

Department stores benefiting from substantial additions to the number of outlets in Ontario should do moderately better than many other sections of the retail trade.

In 1972 automobile sales will not increase as rapidly as in 1971 when sales were boosted artificially by the strike in late 1970.

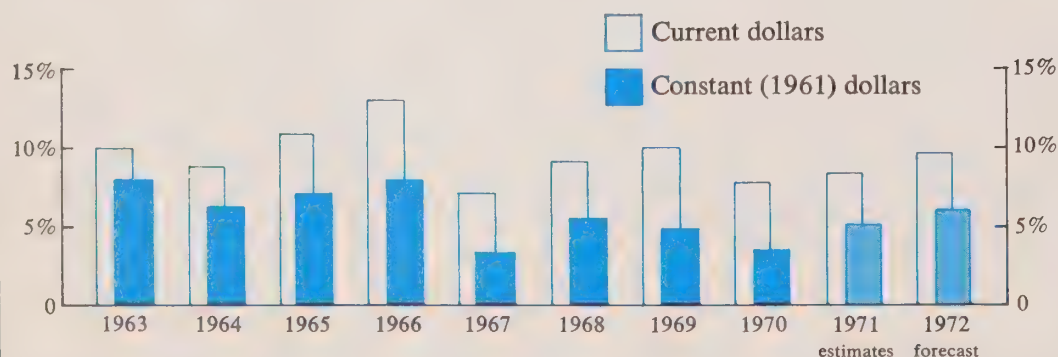
Consumer spending on services, which increased by over 10 per cent, was largely due to a sizable increase in tourist expenditures abroad. Notable gains also occurred in spending on restaurant meals, on motel stays, hotels, and on legal and financial services. It is expected that increases in spending in the services sector will continue at this pace in 1972.

### Private and Public Investment

Estimates made on the basis of surveys conducted by the federal Department of Industry, Trade and Commerce in mid-1971 indicated that capital spending in the province would amount to \$7.5 billion, an increase of 8.9 per cent over the previous year. Figures on levels of capital expenditures for the year are not yet available, but it is likely that this level was realized. In the past there has been a clearly discernible gap between plans and expenditures; while the pace of business activity has accelerated, expenditures have in most instances exceeded the amount planned, while the reverse

### Ontario's Gross Provincial Product

Per cent change from previous year





a true during times of slowdown and uncertain economic conditions. On the basis of evidence, it is likely that capital outlays ended during the last quarter of 1971 and before it is expected that outlays in 1971 increased by 7.0 per cent, not the 8.9 per cent that had been previously forecast.

While total investment in the province did come up to expectations, activity in the residential housing sector exceeded earlier predictions, with the result that housing expenditures contributed more to growth than other sector. This was largely due to a drop of interest rates, greater availability of funds, and to the shortfall of new housing starts in 1970.

H.A. mortgage rates have been declining steadily since April 1970 from a historic high of 10.25 per cent to an average of 8.75 per cent by the end of 1971. It is likely that mortgage rates will stabilize at present levels or slightly in 1972.

Although final year-end data are not yet available, it appears that around 90,000 units were started in Ontario in 1971. In contrast to the immediately preceding years, when there was a sharp trend towards construction of multiple-unit dwellings, 1971 saw a reversal of this pattern and a concentration on single-family dwellings. This was especially true in large urban centres such as Toronto, where the number of single-family housing starts increased by 107 per cent while apartment unit starts rose only one per cent.

Construction initiated by the Ontario Housing Corporation also increased considerably in 1971. Preliminary totals indicate the province has kept pace with the increases in private industry, as 11,000 units<sup>1</sup> were added by OHC.

Ontario has steadily increased its involvement in the housing field since the formation

of OHC in 1964. In 1965, the first full year during which OHC was in operation, public housing starts made up only 1.8 per cent of the total; by 1971, this total had increased to 12 per cent. It is anticipated that with increasing urbanization and accompanying rises in the price of land, public housing needs will continue to increase in the future, and consequently more of the province's resources will have to be allocated to this sector.

A brisk year in residential housing construction is expected again for 1972, but the increases of over 20 per cent experienced in 1971 will not be repeated. Nevertheless, given the current economic situation, efforts will be made by all levels of government to keep housing construction at present levels, so it is expected that 85,000 - 90,000 units will again be started this year. While the total number of starts will probably decrease slightly, investment in the residential sector will rise by around 8.5 per cent.

Some adverse effects on investment in Ontario resulting from the recently passed DISC plan may be noticed by late 1972. The DISC plan permits formation of companies called Domestic International Sales Corporations (DISC) which will be allowed to defer tax on 50 per cent of income as long as profits from the DISC are re-invested in the U.S. Since Ontario has a large proportion of Canada's manufacturing facilities, many of which are subsidiaries of U.S. parent corporations, the DISC plan could lead to substantial decreases in capital spending by U.S.-owned corporations located in Ontario.

With added incentives by U.S. firms to expand operations at home and a general cautious attitude by many Canadian businessmen, it is expected that total non-residential construction will only be 5.8 per cent greater

in 1972 and outlays on machinery and equipment will increase by 6.1 per cent.

On the basis of forecasts of residential construction, machinery and equipment, and non-residential construction, the overall gain in private and public investment is expected to be 6.5 per cent this year over 1971.

### Labour Market Conditions in 1971

In 1971 the overall labour market conditions were the worst since 1961. Unemployment, which climbed to over two hundred thousand last winter, remained at unusually high levels throughout the summer. The federal government policies to stimulate the economy (as originally contained in the June 18 budget) were not strong enough to provide the necessary take-off, and further measures had to be brought forth in the October 14 mini-budget, particularly in view of the U.S. initiatives of August 15. On average, Ontario had about 134,000 unemployed between January and December 1970, but in 1971 the number of unemployed increased to 170,000 during the corresponding period. The number of unemployed in the province from January to December 1971 reached an average of 5.2 per cent of the labour force.

One of the important characteristics of the labour market in the last two years has been the increasing gap between the rate of growth of the labour force and the increase in the number of new jobs in the economy. The labour force increased by 3.8 per cent in 1971 and 3.3 per cent in 1970. Employment, on the other hand, increased by only 2.8 and 2.0 per cent in the comparable periods.

Experience indicates that the goods-producing sectors react more strongly to an economic downturn than do the service industries. When output is curtailed sharply, many heads of families find themselves without a job. Accordingly their wives may seek employment in the more stable service sector, with the hope for better job opportunities than their unemployed husbands.

Another phenomenon of the 1971 labour market was the increased interest of young people in obtaining employment. This may, to some extent, reflect the growing disapproval of the present-day educational system by young people who would rather find a job than continue their education, and the fact that an education does not guarantee a job of their choice on graduation. It is also a reflection of the age distribution of the population, as the number of young people of

### Investment — Ontario (in millions)

	1971	1972	Per Cent Change	
	Estimate	Forecast	1971/70	1972/71
Private & Public Investment	7.3	7.8	7.0	6.5
Residential Construction	1.5	1.7	20.5	8.5
Machinery & Equipment	2.9	3.1	3.0	6.1
Non-Residential Construction	2.9	3.1	5.0	5.8

<sup>1</sup> Estimated by Economic Planning Branch, Department of Treasury and Economics. Figures based on unrounded figures.

<sup>2</sup> Figure includes family and senior citizens housing projects, but does not include student housing projects directly financed by OHC or other agencies. Student housing accounted for about 2400 units in 1971.



working age has increased sharply and will remain high for at least the next decade. A glance at historical data illustrates this. In 1956 young people between 15 and 25 years of age made up 21.4 per cent of the working-age population (14-65 years old). In 1970 their share increased to 27.9 per cent. In 1971 they constituted 28.1 per cent of the working-age population and 28.2 per cent is the expectation for 1972.

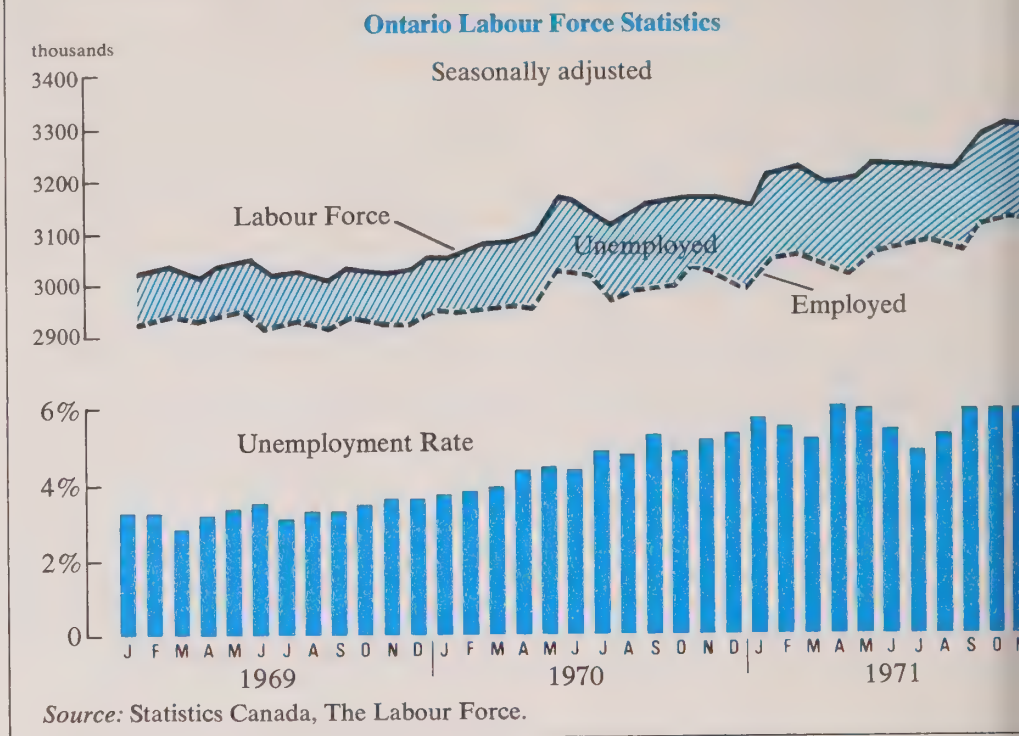
The sizable gap between labour force growth and the increase in new jobs available indicates poor prospects for improved labour market conditions in 1972, even if the economy picks up momentum. There is no doubt that the usual time-lag with which employment responds to the accelerated rate of economic growth will be longer, for the simple reason that there is still ample room for increases in output via increases in productivity of existing workers before it becomes necessary to increase employment.

### Labour Force and Employment in 1972

It is expected that the labour force will grow by 3.4 per cent so that the total number of workers will reach 3,359,000. On the other hand, it is not unlikely that the increase in the labour force could be even greater. Expectations of a rather large, by historical standards, increase in the labour force are based on the following premises:

- 1) Increased numbers of young people entering the labour market.
- 2) Continuation of the steadily growing female participation in the labour force. The number of new female workers looking for jobs in 1972 is estimated at 36,000.
- 3) Continuation of the much higher than usual inflow of migrants into the province. It is estimated that the number of people from other provinces coming to live in Ontario tripled in 1969 and 1970, as jobs in Ontario were still relatively easier to find than in other provinces.
- 4) The new federal unemployment insurance plan coming into effect in January 1972 is very likely to encourage people with marginal labour force attachment to try to find employment.

It is expected that the number of jobs in 1972 will increase by 3.6 per cent (112,000 new jobs). Under these circumstances, the unemployment rate will be 5.0 per cent and the number of unemployed 168,000. It



should be noted that this takes into consideration the positive effect of the provincial government winter employment program designed to employ 42,000 workers as well as the effects of recent steps taken by the federal government. It is not unlikely, however, that the labour force increase may be higher and reach 3.6 per cent, which could mean 175,000 or 5.2 per cent of the workers unemployed, in which case no improvement in the unemployment picture will be obtained.

### Youth Unemployment

Extremely high incidence of unemployment among young people has become a serious concern to the province. In 1970, over 40 per cent of the unemployed were young people. The unemployment rate for the 14-24 year-old group was 7.9 per cent as compared with 3.1 per cent for the 25-64 year-olds. The unemployment rate in Canada for the former age group was 10.3 per cent.

The unemployment rate for 14-19 year-olds in Ontario in 1970 was even higher, 10.8 per cent, or 24 per cent of all unemployed.

In 1971, the unemployment rate among young people was even higher, over 80,000 young workers or 47 per cent of the total unemployed. Considering the overall economic conditions as well as the situation in the job market in the coming year, it is

expected that about 85,000 young people will be without jobs in 1972.

### Corporation Profits

Corporation profits before taxes have completely recovered from their dismal performance in 1970, increasing by 11 per cent in 1971. The further improvement of business conditions throughout 1972 will bring a strong increase in profits. Productivity and increased utilization of capacity will bring costs down, while sales will grow steadily. Under these circumstances profits in 1972 are forecast to increase 14 per cent over 1971.

### Personal Income

Personal income, spurred on by large increases in wages and salaries, increased a healthy 11.5 per cent in 1971. An hourly earnings in Ontario manufacturing increased by 8.8 per cent which is about the same rate of increase as that in 1970, slightly from the 8.1 per cent increase in 1969.

It is expected that gains in wages and salaries will moderate somewhat in 1972, but personal income should increase approximately 10.5 per cent.

Personal disposable income, the major factor in consumer spending, should increase about 9.5 per cent.



# The Input-Output Structure of The Niagara Region

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ional development is mainly influenced growth and changes in the provincial omy. Naturally, regions have grown and continue to grow at different rates depending on their comparative capability to the national, provincial and local market. In fact, determining the manner in which regions will react to a given set of economic stimulants or objectives is a major factor in making any regional projections. In recent years, rapid growth in population, industrialization and urbanization have necessitated the development of comprehensive economic models to cope with the complexity of modern economic structures. Reflecting this need, the Economic Analysis Branch of the Economic and Statistical Services Division has initiated the development of an input-output table for the Province of Ontario as an integral part of a system of provincial economic accounts.

In order to analyze the different economic structures and the concentration of industrial activities for the separate economic regions of Ontario, it was felt that regional inter-industry models should be constructed to complement the model for the provincial economy.

The present study describes in detail the recently completed input-output table for the Niagara Region. This table portrays the regional economic structure in terms of the inter-industry flows of goods and services and their interrelation with the final demand. The study is also designed to explore the extent to which this regional model can be used in our analytical techniques for economic forecasting and identifying the key productive sectors of different regions.

Among the considerations influencing the development of the Niagara Region is the fact that the Niagara area represents one of the major emerging corridors of North America and is within the most rapidly expanding industrial region in Ontario.

The first part of this article outlines the conceptual framework of the Niagara input-output model and provides a concise exposition of the underlying methodology. In the second part, an attempt was made to apply the regional input-output model to estimate regional income multipliers for different sectors and their effects in terms of income. The three basic tables — the transactions table, the direct requirements table and the total requirements table — are examined and presented in tabular form in the Ap-

pendix. The final section provides a summary of the statistical data sources and estimating procedures used in the construction of the model.

## Regional Accounts and an Input-Output Table

An input-output table is considered to be an integral part of an economic and social accounting system.

Regional income accounts are concerned with the income and expenditure flows among producers, consumers and government. Moreover, these accounts show the relationship of the regional economy to that of other regions, and the amount of saving and investment taking place. According to an income accounting system, the transactions occurring in the economy during a certain period, conventionally one year, are classified to one of the three basic forms of economic activity — production, consumption, and accumulation. In an open economy it is necessary to add a fourth account containing transactions with the rest of the world.

Additional sub-accounts can be added, for example, the account relating to production can be subdivided so as to show separately the different activities which make up the productive sector as a whole. In this way a set of input-output accounts is introduced into the regional accounting framework to obtain a more detailed system of social accounting.

As the interindustry account is conceptually and statistically integrated with the regional income and product accounts, the value of gross regional product as well as the flows to each of the components of the final demand sector (government, household, etc.) is the same in the two sets of accounts.<sup>1</sup> However, in the input-output table both the final demand and the value-added components are distributed by sector of origin.

One major reason for constructing a regional table is to facilitate measuring the structural interdependence among different regions under study and the rest of the provincial (or national) economy. Moreover, such a table facilitates the co-ordination of regional statistics and provides a valuable tool for testing the consistency of the direct estimates of the regional gross products. The sectoral details provided by a regional input-output table facilitate a rational approach to the problems of locating public investment and establishing priorities for financial assist-

ance to the investment programs of the private sector.

## THE NIAGARA INTERFLOW TABLE

Interindustry analysis was developed to measure how changes in one particular variable will affect the other variables in the system. A technical change in an industry — changes in the input mix used for the production of a particular commodity — will affect other industries which supply its raw materials. To account for these inter-relationships among different sectors of the economy, a proper industrial classification system must be established to identify certain relevant products with similar production functions. Therefore, products which have dissimilar production functions — even though they are substitutable — must be separately classified since a change in demand for them will have different effects on the economy.

The Niagara table divides the regional economy into 48 productive sectors: 43 manufacturing industries, mining, construction, trade, transportation and storage, services and agriculture and related agricultural activities. The work sheets upon which the final tables are based were originally developed for about 200 sectors.<sup>2</sup> This sectoral classification was chosen on the basis of the Standard Industrial Classification and the availability of data — especially on non-manufacturing sectors. Also it is based on the degree of importance of each sector to the regional economy. Finally, to maximize comparability between the regional and the provincial table it was desirable to choose a level of aggregation close to the provincial level.

Since geographical location does influence production processes, it was necessary to set up a regional interindustry table for the Niagara Region on the basis of direct and actual information on regional accounts, input structure and final demand patterns. Once these regional data are secured, the compilation of a regional input-output table does not differ much from the procedure usually followed in constructing a provincial or national interindustry table. The simplified version of the general input-output model — briefly outlined in the following section — must however be qualified, because the need for a detailed analysis of intra-regional and inter-regional relationships necessitates the introduction of some changes in the framework of the input-output accounting system.

<sup>1</sup>There are, however, some differences between the two sets of accounts due to the different conceptual treatment of some items such as, interest paid or received, etc.

<sup>2</sup>This published version of the table represents

a condensation of a larger matrix consisting of 130 sectors. Under the Ontario Statistics Act, the table can be published only in aggregated form in order to comply with confidentiality requirements.



The reason for the direct approach in establishing a system of regional input-output accounts, rather than relying wholly or partially on the national or the provincial estimates, is that the purpose of this study is to prepare a tool for operational programming rather than theoretical manipulation. A regional model should throw light on the major characteristics of the region and differentiate both the technical structure and final demand patterns from those of the other regions and the provincial economy. Therefore, any attempt to construct a regional input-output table on the basis of the provincial or the national tables — as in the standard Leontief model — implies that input coefficients for the province are identical with those prevailing in the region and hence production processes are geographically invariant.

The compilation of an interflow table involves tracing the flows of different commodities to ultimate buyers both for the purpose of intermediate and final consumption. Also it involves recording the inputs used by each productive sector. The work of constructing the original table was divided into four major stages:

1. Definition and measurement of the output of each sector in the regional economy. For some sectors sufficient data exist to allow direct estimation of gross output. For other sectors however, output data were not available and indirect estimating procedures were applied.
2. Estimation and allocation of inputs by sector. Inputs consist of raw materials and services — domestically produced and/or imported — used in the production process, and primary inputs such as labour and capital costs, etc. Since the information available on primary inputs pertains only to wages and salaries the other items were derived by using a residualling technique.
3. Estimation of final demand for the output of each sector by type of final user, including foreign demand in the form of exports. The export component of final demand consists of the Niagara Region's sales to the rest of Ontario, Canada, and the World.
4. Estimation of distributive costs for wholesale and retail trade, transportation and storage. For purposes of inter-industry analysis these costs or margins have to be shown separately in order that

the table may reflect a purely technical relationship among different sectors. In the producers' price system, each sector is treated as paying trade and transportation costs directly to the trade and transportation sector on all its purchases of inputs. Therefore, within the conceptual framework of this method, distribution costs are charged to the purchasers of commodities. Adopting this method of valuation — producers' prices — requires that the value of all inputs as recorded in the Census of Manufactures be adjusted accordingly. However, due to lack of information on distributive costs, it was assumed that the provincial ratios of the cost items to the purchaser values of each product — as derived from the Ontario Input-Output Table<sup>3</sup> — are applicable to the Niagara Region.

#### Summary of the Standard I/O Technique

As mentioned above, interindustry analysis is mainly concerned with inter-relationships among different productive sectors of the economy. Therefore it is essentially a method of recording detailed statistical information in the form of a table or matrix. In order to understand the basic relationship of the standard input-output model, it is best expressed in algebraic formulas. If the flow of goods and services from sector  $i$  to sector  $j$  is indicated by  $x_{ij}$ , and the total output of sector  $i$  by  $x_i$ , then we have

$$x_i = \sum_{j=1}^n x_{ij} + d_i \quad (i = 1, \dots, n) \quad (1)$$

where  $d_i$  is the part of sector  $i$ 's output which is not absorbed by any of the  $n$  productive sectors. This is known as the final demand for the output of sector  $i$ , which consists of commodities delivered directly to consumers, government agencies, foreign firms, and to the business sector in terms of expenditure on investment goods. Since the interindustry flows  $x_{ij}$  are all regarded as current flows (not capital flows), investment goods supplied by any sector should be considered as a component of final demand. Of course, these capital goods have a dual function. They are part of the total expenditure during the year and they are also productive goods in the future. Since this model is a static one and does not take into account the time factor, the second function will be ignored and investment expenditure only will be considered as part of final demand.

The decomposition of (1) describes the total output of each sector as the sum of  $n + 1$  non-negative components. In words it deals with the output side of transactions on each sector. On the input side of the transactions, the values  $x_{1j}, \dots, x_{nj}$  refer to the inputs purchased by sector  $j$  from each of the  $n$  sectors. In addition to intermediate inputs, there are primary inputs which are by definition, the flows of goods and services sold by economic agents outside the business sector. Wages and salaries, for example, are the amounts paid for labour services provided by hired workers. There is also depreciation on capital goods which is considered to be a service rendered by capital goods, etc.

Total inputs of any sector can be expressed by the following equation:

$$x_j = \sum_{i=1}^n x_{ij} + \sum_{h=1}^m Y_{hj} \quad (j = 1, \dots, n)$$

where  $Y_{hj}$  is the value of  $h$ th primary input which is absorbed by sector  $j$ . On the left side of equation (2), we have the total inputs to sector  $j$  which is equal to the total output of the same sector.

The ratios of the interindustry flows  $x_{ij}$  to the primary input flows  $y_{hj}$  to total output of the purchasing industry  $j$  can be written as

$$a_{ij} = \frac{x_{ij}}{x_j} \quad (i, j = 1, \dots, n)$$

$$y_{hj} = \frac{Y_{hj}}{x_j} \quad (h = 1, \dots, m; j = 1, \dots, n)$$

where  $a_{ij}$  represents the sectoral input coefficients (intermediate input coefficients) while  $y_{hj}$  represents the primary input coefficients (income coefficients).

On the assumption of fixed technical coefficients, each dollar's worth of output of sector  $j$  requires a fixed amount of  $a_{ij}$  of output supplied by the  $i$  sectors to serve as inputs.

From (1) and (3) we obtain:

$$x_i = \sum_{j=1}^n a_{ij} x_j + d_i \quad (i = 1, \dots, n)$$

In matrix form (5) can be written:

$$\mathbf{X} = \mathbf{A}\mathbf{X} + \mathbf{D} \quad \text{or} \quad (\mathbf{I} - \mathbf{A})\mathbf{X} = \mathbf{D}$$

where  $\mathbf{X}$  is the  $n$  element column vector of total output by sectors;  $\mathbf{D}$  the vector of final demands, and  $\mathbf{A}$  is the  $n \times n$  square matrix of input coefficients.

<sup>3</sup>A detailed description of the method used for adjusting the table for these distributive costs is given in "The Input-Output Structure of the Ontario Economy," Ontario Economic Review, Vol. 8, No. 1.



sectoral input coefficients. Assuming that  $|A| \neq 0$  and premultiplying equation (7) by  $(I - A)^{-1}$  the solution of the model can be given by:

$$X = (I - A)^{-1} D \quad (7)$$

If there is stability in the sense that the technical coefficients remain fixed, the total output which is required to meet a given level of final demand can be estimated. However, the real world especially over a relatively long time period, does not conform to these stable relationships as described above. Therefore, any long-term forecasts need to be modified and adjusted to take this into account.<sup>4</sup> The stability of the technical coefficients is governed not only by the state of technology prevailing during a certain time period but also by many other factors. Changes in relative prices, introduction of new products, the level of aggregation at which the interindustry table is constructed are all factors responsible for the instability in the input-output coefficients. The basic equations of the input-output model can be summarized as:

$$\begin{aligned} E &= [(I - A)^{-1} - I] D \\ &= A (I - A)^{-1} D \end{aligned} \quad (8)$$

$$x_i - d_i = \sum_{j=1}^n x_{ij} \quad (i = 1, \dots, n)$$

From equation (8) one can compute a conditional forecast of the vector  $E_{t+m}$  of intermediate demand by sectors in the year  $t + m$  on the basis of a given vector of final demand  $D_{t+m}$ , in year  $t + m$  and the industry input coefficients matrix  $A_t$  of year  $t$ .

The other equation can be written in the following form:

$$Y = y_{hj} (I - A)^{-1} D \quad (9)$$

$$Y = y_{hj} X$$

Given final demand  $D_{t+m}$  of that year and on the basis of  $A_t$  and the primary input coefficients matrix  $y_{hj,t}$  of the year  $t$ , equation (9) enables us to make a forecast of  $Y_{t+m}$ , the primary demand by each income category in year  $t + m$  (in this model we have two — wages and salaries, and other value added).

Equations 8 and 9 are considered to be the basic input-output forecasting equations. The first equation deals with that part of the total output produced by each industry

and sold to the  $n$  sectors for further processing, the second deals with the total value of primary inputs absorbed by the  $n$  sectors.

### Regional Income Effects of Changes in Demand

In this section, an attempt is made to compute the income effects in the Niagara Region resulting from changes in the final demand for the product of each sector in the regional economy. A change in demand for the product of one sector is diffused throughout the system and generates a chain-reaction in the rest of the economy. This diffusion effect is due to the interdependence which exists among different sectors. In a regional development context, these calculations are essential in identifying the key sectors in the region under study in terms of regional income generated, not only in the sector experiencing a change, but also in all other sectors related to it.

A given change in final demand for the product of any sector will generate different income effects in different sectors, depending on the degree of interdependence of that particular sector with other sectors. Therefore, a low degree of inter-relationship with other sectors in the economy will produce a small total income effect and vice versa. For example, the income coefficients in both the cotton, wool and synthetic textile and pulp and paper industries are the same but the total income effects of a change in demand for their output are different. A change of one dollar in final demand for the product of the cotton and wool industry will increase total income in the regional economy by approximately \$1.08. On the other hand, a similar change in the demand for pulp and paper products will generate about \$1.29 of income. This difference is due to the varying degree of interdependence among sectors. For the purpose of regional economic planning, it is not only necessary to determine the total income effects resulting from a given change in demand for the output of a particular sector but also necessary to estimate these effects on different income components, i.e. wages and salaries and subsequently value added. In the above example, an increase in demand for the products of the cotton and wool industry generate a larger income effect in terms of employment. Therefore, if increased employment in the region is the policy goal, the cotton and wool industry would be considered for stimulation in preference to the pulp and paper industry.

The effects of the induced changes in demand can be measured by using the technical coefficients and inverse matrices as derived from the input-output table for the Niagara Region. The initial impact of a change in final demand is a change in output by the sector directly affected and consequently a change in income (wages and salaries paid to labour and other investment income) originating in that sector. If the industry changes the level of its output by the same amount as the change in demand, the direct income effects can be calculated by using the technical coefficient matrix shown in Table 2. For example the direct income effect of an increase of one dollar in final demand for the products of the iron and steel industry will be .22 cents paid out in wages and salaries and .28 cents for other investment income. Hence, income originating in an industry is affected immediately by a rise in output.

This original increase in the output of a particular sector will generate certain changes in the demand for the products of other industries, which in turn will result in an increase in the output of the other Niagara Region industries that are directly or indirectly related to the industry experiencing the initial change in demand.

The following table shows the total income effects of a one dollar increase in final demand for the products of each sector in the regional economy. Direct effects are calculated by multiplying the original change in final demand by the income coefficients for wages and salaries, and other value added. Total income effects are computed by multiplying each row element of the inverse matrix of a particular industry by the corresponding income coefficient and summing the results. In computing the indirect impact on the total regional income, of a unit change in the iron and steel industry, we obtain:

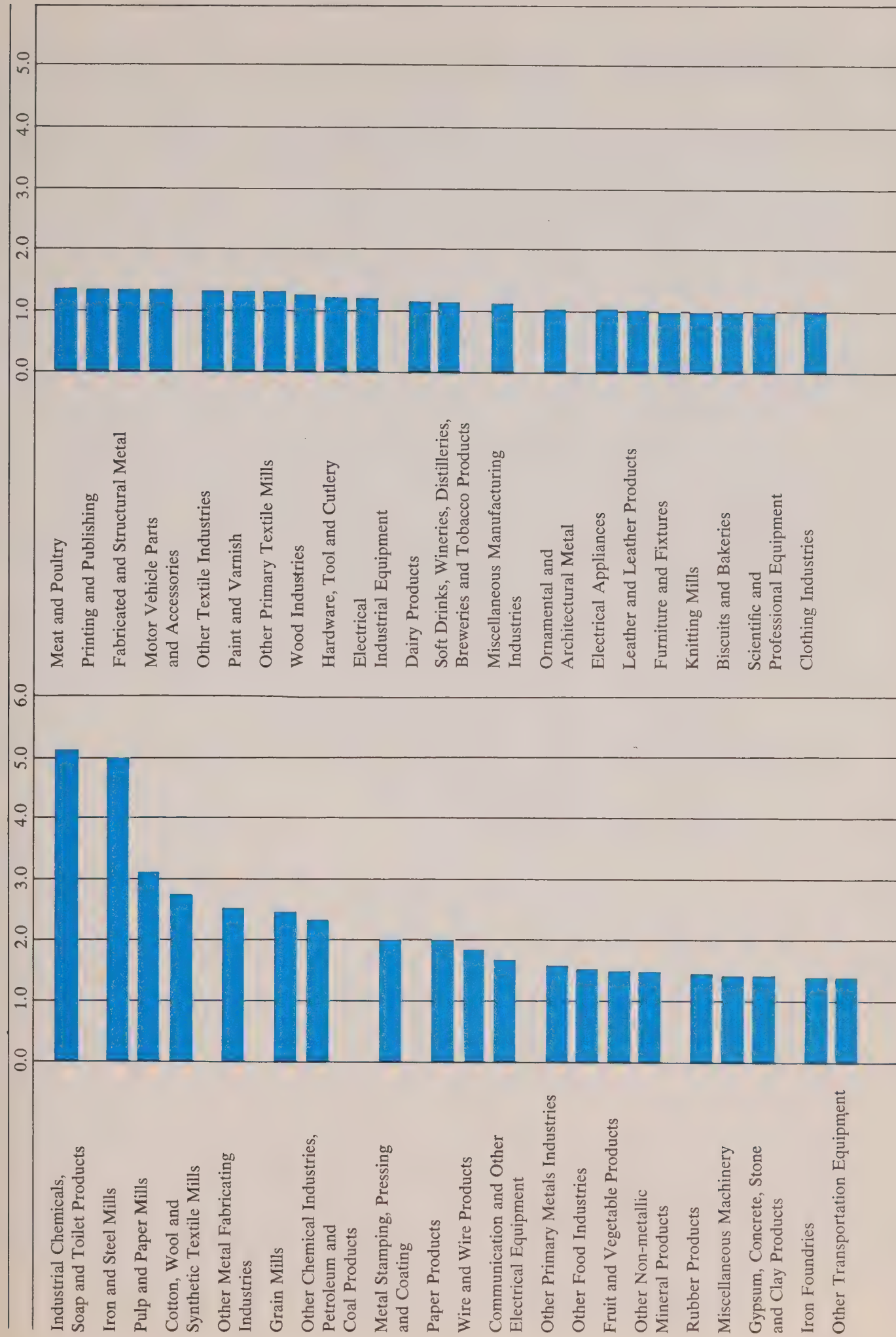
$$\begin{aligned} &.023824 \times .423056 + .037203 \times .548588 \\ &+ \dots + .007669 \times .728210 + \\ &.051989 \times .0 = 2.499913. \end{aligned}$$

The income multiplier, (column 4 of the following table) shows how much total regional income will rise per unit increase in income of the industry named at the left, assuming all other final demand remains constant. In other words, each entry shows the total Niagara income change associated with a unit income change in the industry listed at the left.

**Table 1 – Income Effects Generated by a One-Dollar Increase in Final Demand, Niagara Region, 1967**

I-O No.	Industry	Wages and Salaries	Other Value Added	Total	Incor Mult
3	Meat and Poultry	.154367	.076313	.230680	1.31
4	Dairy Products	.285678	.026899	.312577	1.14
5	Fruit and Vegetable Products	.276348	.164626	.440974	1.52
6	Grain Mills	.280228	.193253	.473481	2.46
7	Biscuits and Bakeries	.337496	.086102	.423598	1.01
8	Other Food Industries	.172804	.135168	.307972	1.61
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.214469	.279530	.493999	1.14
10	Rubber Products	.284199	.377410	.661609	1.48
11	Leather and Leather Products	.349778	.016378	.366156	1.04
12	Cotton, Wool and Synthetic Textile Mills	.706683	.377922	1.084605	2.69
13	Other Primary Textile Mills	.290115	.176747	.466862	1.22
14	Other Textiles Industries	.278747	.119451	.398198	1.26
15	Knitting Mills	.312467	.063422	.375889	1.03
16	Clothing Industry	.338629	.156210	.494839	1.00
17	Wood Industry	.319472	.142940	.462412	1.19
18	Furniture and Fixtures	.226338	.078746	.305084	1.04
19	Pulp and Paper Mills	.848733	.437578	1.286311	3.10
20	Paper Products	.446392	.233808	.680200	2.02
21	Printing and Publishing	.537596	.248170	.785766	1.31
22	Iron and Steel Mills	1.596281	.903632	2.499913	5.00
23	Iron Foundries	.329839	.160203	.490042	1.33
24	Other Primary Metals Industries	.379359	.191086	.570445	1.67
25	Fabricated and Structural Metal	.381903	.049236	.431139	1.28
26	Ornamental and Architectural Metal	.245954	.068566	.314520	1.05
27	Metal Stamping, Pressing and Coating	.426525	.221458	.647983	2.03
28	Wire and Wire Products	.420406	.210050	.630456	1.88
29	Hardware, Tool and Cutlery	.385076	.096260	.481336	1.17
30	Other Metal Fabricating Industries	.696158	.298962	.995120	2.52
31	Miscellaneous Machinery	.330329	.108827	.439156	1.35
32	Motor Vehicle Parts and Accessories	.379750	.200173	.579923	1.28
33	Other Transportation Equipment	.359021	.136844	.495865	1.32
34	Electrical Appliances	.226973	.104180	.331153	1.05
35	Electrical Industrial Equipment	.400939	.307926	.708865	1.17
36	Communication and Other Electrical Equipment	.450395	.222396	.672791	1.67
37	Gypsum, Concrete, Stone and Clay Products	.340448	.243098	.583546	1.35
38	Other Non-metallic Mineral Products	.458560	.184539	.643099	1.57
39	Paint and Varnish	.218435	.024501	.242936	1.24
40	Industrial Chemicals, Soap and Toilet Products	.598833	.319580	.918413	5.09
41	Other Chemical Industries, Petroleum and Coal Products	.233159	.156318	.389477	2.34
42	Scientific and Professional Equipment	.340165	.113643	.453808	1.07
43	Miscellaneous Manufacturing Industries	.393925	.295860	.689785	1.50





Calculation of the results shown in the preceding table can be summarized by the following equations:

$$T_j = W_j + V_j \quad (j = 1, \dots, n) \quad (10)$$

where  $T_j$ ,  $W_j$ ,  $V_j$  stand for total regional income, wages and other income generated respectively by a dollar increase in the final demand of sector  $j$ . The  $W_j$ 's are generated in the following manner:

$$W_j = \mathbf{w}(\mathbf{I} - \mathbf{A})^{-1} \mathbf{e} \quad (j = 1, \dots, n) \quad (11)$$

where  $\mathbf{w}$  is a row vector of wage shares per dollar of output for each sector and  $\mathbf{e}$  is the standard base vector with zeros everywhere except in the  $j^{\text{th}}$  position where it is equal to one. Similarly  $V_j$  is calculated as follows:

$$V_j = \mathbf{v}(\mathbf{I} - \mathbf{A})^{-1} \mathbf{e} \quad (j = 1, \dots, n) \quad (12)$$

where  $\mathbf{v}$  is a row vector of non-wage income per dollar of output in each sector.

From (10), (11) and (12) it is easily seen that

$$T_j = (\mathbf{w} + \mathbf{v})(\mathbf{I} - \mathbf{A})^{-1} \mathbf{e} \quad (j = 1, \dots, n) \quad (13)$$

The income multiplier  $K_j$  is estimated according to the following equation:

$$K_j = T_j / (W_j + V_j) \quad (j = 1, \dots, n) \quad (14)$$

A change of unit income represents varying changes in the total output of each industry. For example, a one million dollar direct change in income in the wire and wire products industry (Sector No. 28) would require a change in total output of that industry of about 4.35 million dollars — the reciprocal of the income coefficient — while a similar change in motor vehicle parts and accessories would require a total output change of about two million dollars.

Diagram 2, on the other hand, shows the the Niagara Region in terms of total regional income induced by a one dollar change in income in any particular sector. The highest income multipliers are for those sectors with higher degrees of interdependency. On this basis industrial chemicals, Iron and Steel Mills, Pulp and Paper Industries, are evidently considered key sectors in the regional economy.

Diagram 2, on the other hand, shows the total income effects generated by a one dollar increase in final demand for the product of each sector. This income effect is shown in terms of wages and salaries and other value added. According to this Diagram, Iron and Steel Mills have the highest effects in terms of both components of value added.

So far, it has been assumed that all other final demand components will not be affected by changes in income. Regardless of the limitation, these calculations still throw some light on the magnitude and the direction of particular effects due to certain changes in one of the exogenous variables in the model. The other implicit assumptions of this model are; first, the acceleration effect — the effect of a change in demand on investment expenditures — is zero. In other words, changes in any of the final demand components will not lead to certain modifications in investment expenditure plans of business sectors; second, the initial increase or decrease in production and income will not lead to any substantial changes in personal consumer expenditures. However, the validity of the present analysis and the estimation of income multipliers depends on the essential assumption that initial changes in any of the final demand components are of relatively small magnitude and will not affect substantially the other components of final demand.

To account for these factors, a dynamic feature has to be built into the interindustry model. The statistical requirements for such adjustments are not available at the present time. However, the Economic Analysis Branch is now constructing a capital expenditure matrix which will enhance the usefulness of the present model and increase the accuracy of the statistical results.

## DEFINITIONS OF OUTPUT AND ALLOCATION OF INPUTS BY SECTOR

### Agriculture

Agriculture is the most important primary activity in the Niagara Region. However, the relative importance of this sector is declining due to rapid urbanization. In Ontario, from 1951 to 1961, the agricultural labour force declined by approximately 16 per cent, whereas in the Niagara Region it declined by about 35 per cent. In order to serve the demands of the growing urban population, it has been necessary to intensify agricultural operations since more than 20 per cent of the improved farmland was converted to other land uses, i.e., residential, industrial, etc. As a result, the number of farms has declined by about 27 per cent, while the market value of land and buildings has increased over twofold.

For the purpose of interindustry analysis, the total value of agricultural output is de-

finied to include cash receipts from the sale of farm products, value of income in kind, and the imputed value of agricultural commodities produced and consumed on the farm. The value of changes in field crop and livestock inventories. In spite of the fact that many of these data are available at the provincial level, there are no comparable statistics for the regions. The Ontario Department of Agriculture and Food, however, publishes statistics on farm value of agricultural products by county. From this information the ratio of the Niagara Region to the province was derived. Then, by applying this ratio to Ontario's farm cash receipts from farm operations, a total for farm cash receipts in the Niagara Region was derived. Due to lack of information on other components of agricultural output — as defined above — it was assumed that the regional change in inventories and income in kind represented the same proportion of total cash receipts as the province. Accordingly, the estimated total value of agricultural output in the Niagara Region during 1967 was \$198 million.

To estimate the total value of input in both intermediate and primary, the provincial technical coefficients — as derived from the Ontario Input-Output Table were assumed to apply to Niagara's agricultural sector. This assumption can be relaxed and more accurate estimates of total agricultural inputs and components can be derived when more data become available.

### Forestry and Fisheries

Forestry in the Niagara Region is of minor importance, and has a negligible annual value of output. The control total for the value of output of the fishing industry was estimated on the basis of data published annually in Statistics Canada Bulletin *Fisheries Statistics*, and Ontario Department of Lands and Forests statistics for provincial fisheries.

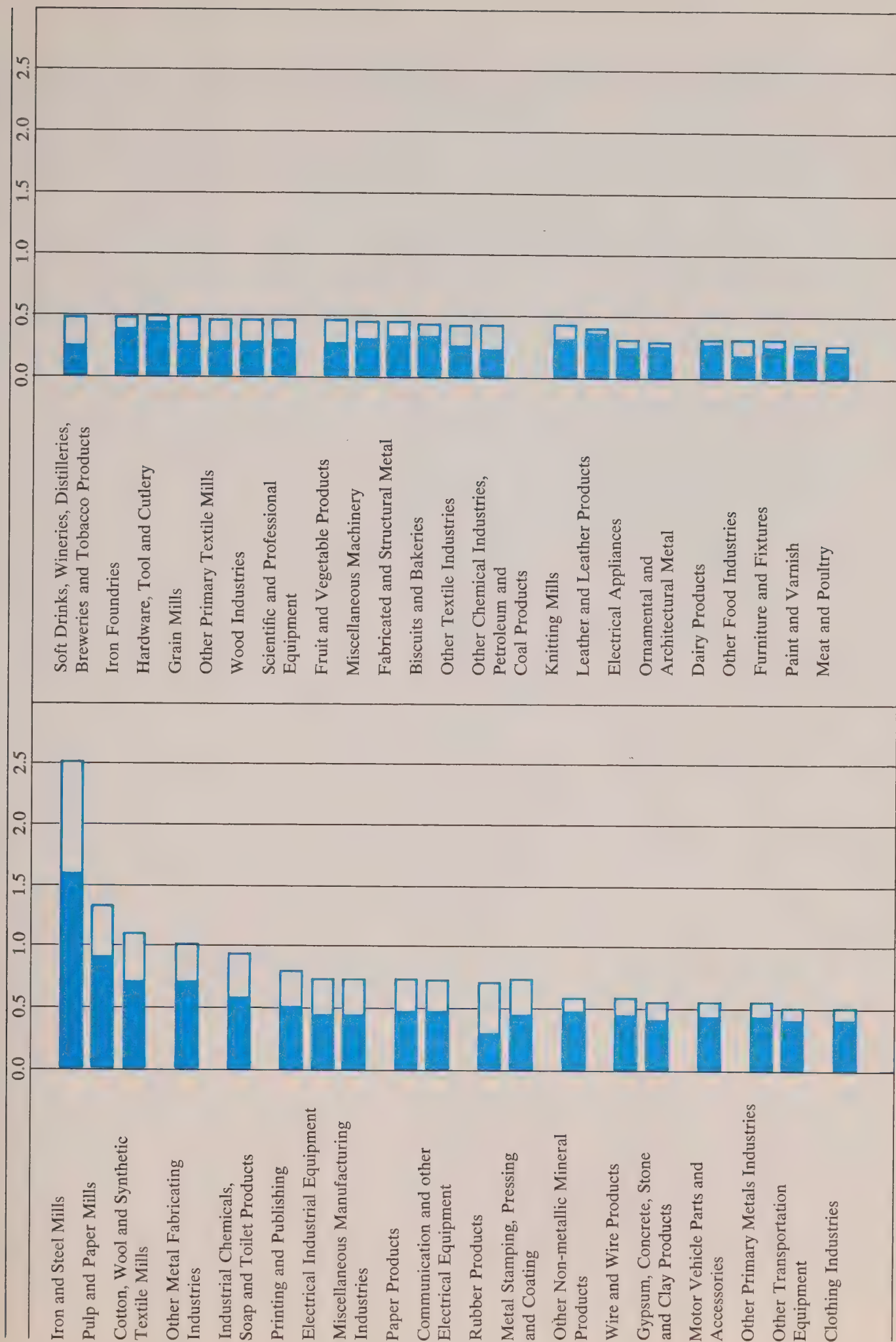
The value of output of the trapping industry was estimated on the basis of provincial statistics pertaining to the value of fur.

Provincial input coefficients were used to estimate the distribution of total value of input used during the year 1967 in the production process of this sector.

### Mining

Mining industries represent the second primary activity in the Niagara Region. The value of mineral products produced in the region is





Other Value Added

Wages and Salaries

made up about 3 per cent of the total value of provincial mineral output. The region produces almost 100 per cent of Ontario's gypsum, 25 per cent of its natural gas and approximately 13 per cent of its structural materials. The value of mineral products produced during 1967 reached a total of about 20.7 million dollars, an increase of 42 per cent over the 1961 level. The mining industries contribution to employment in the Niagara Region is quite small since mining employs only about 0.3 per cent of the total regional labour force.

The principal source of data on mining industries in the Niagara Region is the annual Census of Mines compiled by Statistics Canada. The data contained in the census questionnaires are compiled on an establishment basis, and through the co-operation of the Ontario Statistical Centre different mining establishments operating in the Niagara Region were identified and aggregated. This information on mineral production in the Niagara Region was supplemented by other commodity schedules prepared by Statistics Canada and some estimates made available by the Ontario Department of Transportation and Communications on the volume and cost of sand and gravel and limestone bought from various establishments which are not included in the Annual Census of Mines.

Other data provided by these commodity schedules are mineral products produced as secondary products by other industries. These data were incorporated in the secondary products matrix for all industries operating in the Niagara Region. Finally, the value of output of the mineral fuel industry in the region was derived from statistics published by the Department of Mines and Northern Affairs on the production of crude oil and natural gas.

The allocation of total inputs of the mining industries in the region was made on the basis of information pertaining to raw materials and supplies purchased by the mining establishments derived by the 1967 Annual Census of Mining.

### Manufacturing

The principal data source on manufacturing was the 1967 Annual Census of Manufactures for the Province of Ontario compiled by Statistics Canada on an establishment basis. The Summary Schedule available for each establishment provides information on raw materials, supplies, purchased components, semi-processed goods, and fuel and

electricity used in the production process during the year. In addition, each schedule contains data on value of shipments, changes in inventories of raw materials, finished goods and goods in process and the value of wages and salaries. However, such detailed information is not equally available for all industries due to the reporting system on which the census is based. For example, small establishments are required to report only totals for raw materials purchased and goods shipped.

For the purpose of setting up the inter-

industry table for the manufacturing industries in the Niagara Region, only the establishments which operate in the region classified according to the Standard Industrial Classification. There were about 1,000 manufacturing establishments operating in the Niagara Region in 1967. The first in constructing the regional interindustry flow table for this sector required determination of control totals for the value of output produced, and inputs used by each industry.

The following table shows the definition and derivation of various control totals.

**Table 2 — Iron and Steel Mills, 1967 (SIC: 2910)**  
(\$000)

	Sub-total	Total
(I) Value of Production:		
(A) Value of Shipments (at Factor Cost)		
Primary Products	767,258	
Secondary Products	23,188	
Amount Received for Work Done	2,840	
Total	793,286	
Less Adjustments	—1,240	
(B) Adjusted Value of Shipments and Work Done	792,046	
(C) Value of Fixed Assets Produced	2,491	
(D) All Other Revenues (Including Sales of Electricity)	211	
(E) ± Changes in Inventories	+973	
Total Value of Production	795,721	795,721
(II) Intermediate Inputs (at Market Price):		
(A) Cost of Materials		
Supplies and Materials	288,908	
Fuel	18,195	
Purchased Electrical Energy	13,264	
Cost of Contract Work	2,179	
Maintenance and Repair	50,824	
Others	919	
Cost of Machinery and New Building	62	
Total	374,351	
(B) Total Cost of Services	23,055	
Total Intermediate Inputs	397,406	397,406
(III) Total Wages and Salaries	178,681	
(IV) Other Primary Inputs	219,634	
(V) Value Added (at Factor Cost)	398,315	398,315



Iron and Steel Industry (sector No. 22), the Census of Manufactures records show the value of shipments. It was therefore necessary to adjust these figures for changes in inventories of finished goods and goods in process accrued during the year 1967, while further adjustments were required to exclude the value of products purchased and resold without further processing. On the input side, the census does not provide the total cost of services used by an industry. Hence, these costs were estimated by applying the provincial input coefficients as derived from the Ontario Input-Output Table.

Since census information is compiled on an establishment basis additional problems were encountered classifying commodities on the basis of the Standard Industrial Classification. In addition to their principal products, establishments within an industry may produce secondary products which are considered, in an interindustry context, priority to other industries. The difference between the industrial classification used in the census and the input-output concept necessitates the identification and reclassification of industrial output and subsequent allocation to the appropriate industry. The Niagara Region, however, does not have a full industrial representation, in other words, not all industries operating in the province are represented in the region. The absence of some industries creates a problem in the treatment of secondary products. Since the value of the secondary products of Niagara industries constitute an insignificant part of the total output of each industry, it was decided to disregard the process of allocating them.

The second step in the analysis of the manufacturing sectors involved the construction of a matrix showing the flows of inputs purchased and used by each industry in the production process. For most industries, a detailed breakdown of raw materials and fuel and electricity purchased is available from the 1967 Annual Census of Manufactures. A supplementary listing of all other raw materials and containers used compiled from the Ontario Statistical Centre from establishment reports reduced the value of items which could not be allocated to a specific industry-of-origin. The remaining unallocated value was distributed in the same manner as that in the census questionnaires.

**Table 3 — Ranking of Manufacturing Industries by Level of Total Output Produced, Niagara Region, 1967**  
(Valued at Producers' Prices in \$000)

Rank	I-O No.	Industry	Total Output	Percentage Distribution
1	22	Iron and Steel Mills	797,053	23.6
2	32	Motor Vehicle Parts and Accessories	248,245	7.4
3	40	Industrial Chemicals, Soap and Toilet Products	228,838	6.8
4	30	Other Metal Fabricating Industries	222,208	6.6
5	31	Miscellaneous Machinery	200,011	5.9
6	24	Other Primary Metals Industries	113,709	3.4
7	28	Wire and Wire Products	106,502	3.2
8	10	Rubber Products	97,212	2.9
9	19	Pulp and Paper Mills	95,506	2.8
10	27	Metal Stamping, Pressing and Coating	89,526	2.7
11	35	Electrical Industrial Equipment	87,865	2.6
12	33	Other Transportation Equipment	81,309	2.4
13	38	Other Non-metallic Mineral Products	76,405	2.3
14	5	Fruit and Vegetable Products	65,017	1.9
15	34	Electrical Appliances	61,451	1.8
16	20	Paper Products	57,733	1.7
17	37	Gypsum, Concrete, Stone and Clay Products	55,535	1.6
18	41	Other Chemical Industries, Petroleum and Coal Products	52,052	1.5
19	6	Grain Mills	51,836	1.5
20	3	Meat and Poultry	46,806	1.4
21	12	Cotton, Wool and Synthetic Textile Mills	45,888	1.4
22	8	Other Food Industries	45,222	1.3
23	25	Fabricated and Structural Metal	42,404	1.3
24	36	Communication and Other Electrical Equipment	40,967	1.2
25	23	Iron Foundries	38,800	1.2
26	21	Printing and Publishing	37,301	1.1
27	13	Other Primary Textile Mills	36,926	1.1
28	43	Miscellaneous Manufacturing Industries	35,329	1.0
29	9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	33,787	1.0
30	4	Dairy Products	30,035	0.9
31	15	Knitting Mills	19,572	0.6
32	29	Hardware, Tool & Cutlery	19,120	0.6
33	17	Wood Industries	17,504	0.5
34	16	Clothing Industries	17,486	0.5
35	26	Ornamental and Architectural Metal	17,457	0.5
36	7	Biscuits and Bakeries	17,080	0.5
37	18	Furniture and Fixtures	15,588	0.5
38	39	Paint and Varnish	9,798	0.3
39	14	Other Textile Industries	8,160	0.2
40	11	Leather and Leather Products	7,348	0.2
41	42	Scientific and Professional Equipment	2,399	0.1
<b>Total</b>			<b>3,372,990</b>	<b>100.0</b>

### **Construction**

The construction sector for the regional inter-industry table includes all construction work performed in the Niagara Region during 1967 and carried out either by the construction industry proper or by the labour force of other industries. New construction consists of all new work put in place, including additions, major renovations, conversions and alterations where either structural change takes place or the life of an existing asset is extended. On the basis of this definition a control total for new construction for the year 1967 in the Niagara Region was estimated. The Statistics Canada publication, *Private and Public Investment in Canada*, shows the location of new construction only by province. Consequently, published statistics on the value of building permits issued in the province by economic region as well as type of construction, were used as a basis for estimating the total value of construction at the regional level. This method of estimation is justified by the fact that almost 70 per cent of the total value of construction work reported for the province in 1967 consists of residential construction and repairs.

Finally, due to lack of data on the cost structure of the construction sector at the regional level, it was assumed that the provincial input coefficients — as shown in the Ontario Input-Output Table — apply to the Niagara Region.

### **Services**

Due to lack of information, at the regional level on the service industries, it was necessary to adopt an indirect estimating procedure. The service industries encompass financial intermediaries, repair, amusement, recreational, health, education, personal business and welfare services. The control total for the value of output of the service sector was estimated by assuming that the provincial ratio of the output of services to gross provincial product for the year 1967, applies to the Niagara Region. The final step in the analysis of the service industries was the estimation of total intermediate inputs and their sectoral allocation within the Niagara input-output classification. This was done by using the input coefficients as derived from the Ontario Input-Output Table.

### **Transportation, Storage and Trade**

The value of output of the trade sector is defined as the trade mark-up. On the other

hand, the transportation and storage sector is defined as including all transportation and storage establishments. The output of this sector represents the total revenue derived from transporting Niagara's output to users either within or outside the region. Since adequate information for estimating the regional output of these industries is not available, the provincial trade and transportation mark-ups derived from the Ontario Input-Output Table were applied to Niagara Input-Output Table, valued at purchasers' prices. This method serves a dual purpose: it facilitates the revaluation of each table entry from purchasers' to producers' prices and simultaneously permits estimation of the inputs of this sector into each industry of the regional economy.

### **Treatment of Regional Imports**

One of the major problems to be solved before constructing a regional input-output table, is deciding on the method by which the value of exports and imports of the region will be estimated. According to the standard Leontief open model, exports are treated as autonomous elements of final demand while imports of intermediate products are estimated on the basis of fixed ratios of the inputs to the level of total output of each sector.

Due to lack of statistical information on interregional and international trade flows, an indirect estimating procedure was adopted to derive the value of regional exports and imports by sector. The first step was to derive the trade balance for each sector. This trade balance represents the deficit or surplus of the domestic output produced by each sector to meet the direct and indirect requirements of the regional economy. In other words, it is the difference between the total output requirement — intermediate plus final demand — and the actual output produced by each sector. A positive trade balance for any sector indicates that the region is a net exporter of the product of that sector, whereas a negative value shows that the region is a net importer.

After determining the trade balance by sector, the next step is to distribute proportionately the negative values — or net imports — across each row and reduce the value of intermediate demand in each sector by the same amount. This derived imports matrix

was reduced to a row vector which represents the total imported intermediate inputs in the production process of each sector (Row No. 49 of Table 2 in the Appendix).

The implicit assumption is that input requirements will be satisfied first from domestically produced goods to the extent regional output is available. It is also assumed that Niagara's local products have a locational advantage over imported materials. On the other hand, if the Niagara output of a particular product is not sufficient to meet regional needs, each sector will distribute its input requirements proportionately between domestic output and importation of the product.

### **Final Demand**

The final demand component consists of that part of the total output of each sector which is allocated outside of the productive sector of the economy and is consumed. In other words, the final demand sector encompasses all demand which is not accounted for through the input requirements component mentioned above, this sector consists of personal consumer expenditure on goods and services, gross regional capital formation, changes in inventories, government expenditure (current account) at three levels — federal, provincial and municipal, and foreign regional exports to the rest of Canada and the world. Due to lack of data on different final demand categories at the regional level, it was decided to estimate their control total on the basis of the input-output table for the province. After gross regional product was estimated for the Niagara Region it was distributed among the different final demand categories — except for regional exports — by applying the same percentage distribution as for the gross provincial product.

The sectoral allocation to each category of the final demand sector was approximated by applying the corresponding pattern derived from the provincial input-output table. Because the final demand sector is considered as the exogenous variable in the model, it does not influence the technical structure of the regional economy, this estimating procedure will not introduce a major distortion into the basic model. However, when more accurate rate information becomes available, it can be easily incorporated into the model.



Table 4 – Total Intermediate Domestic Input as a Percentage of Total Input, Niagara Region, 1967  
(Expressed at Producers' Prices in \$000)

Industry	Total Intermediate Domestic Input Less		Per Cent
	Intra-Industry Input	Total Input	
Agriculture, Forestry and Fishing	81,813	198,834	41.14
Mining	7,122	20,746	34.32
Meat and Poultry	32,077	46,806	68.53
Dairy Products	19,719	30,035	65.65
Fruit and Vegetable Products	33,959	65,017	52.23
Grain Mills	36,155	51,836	69.74
Biscuits and Bakeries	8,073	17,080	47.26
Other Food Industries	30,916	45,222	68.36
Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	12,589	33,787	37.25
Rubber Products	28,245	997,212	29.05
Leather and Leather Products	2,391	7,348	32.53
Cotton, Wool and Synthetic Textile Mills	6,392	45,888	13.92
Other Primary Textile Mills	10,741	36,926	29.08
Other Textile Industries	3,056	8,160	37.45
Knitting Mills	9,486	19,572	48.46
Clothing Industries	7,463	17,486	42.67
Wood Industries	4,198	17,504	23.98
Furniture and Fixtures	8,590	15,588	55.10
Pulp and Paper Mills	19,731	95,506	20.65
Paper Products	32,118	57,733	55.63
Printing and Publishing	12,142	37,301	32.55
Iron and Steel Mills	139,390	797,053	17.48
Iron Foundries	22,022	38,800	56.75
Other Primary Metals Industries	61,864	113,709	54.40
Fabricated and Structural Metal	27,007	42,404	63.68
Ornamental and Architectural Metal	10,505	17,457	60.17
Metal Stamping, Pressing and Coating	54,995	89,526	61.42
Wire and Wire Products	46,654	106,502	43.80
Hardware, Tool and Cutlery	8,220	19,120	42.99
Other Metal Fabricating Industries	115,386	222,208	51.92
Miscellaneous Machinery	119,077	200,011	59.53
Motor Vehicle Parts and Accessories	98,440	248,245	39.65
Other Transportation Equipment	29,998	81,309	36.89
Electrical Appliances	33,719	61,451	54.87
Electrical Industrial Equipment	27,657	87,865	31.47
Communication and Other Electrical Equipment	10,782	40,967	26.31
Gypsum, Concrete, Stone and Clay Products	19,716	55,535	35.50
Other Non-metallic Mineral Products	24,620	76,405	32.22
Paint and Varnish	5,130	9,798	52.35
Industrial Chemicals, Soap and Toilet Products	97,272	228,838	42.50
Other Chemical Industries, Petroleum and Coal Products	35,557	52,052	68.31
Scientific and Professional Equipment			
Miscellaneous Manufacturing Industries	14,135	35,329	40.00
Construction, Maintenance and Repair	168,061	450,595	37.29
Transportation, Storage and Trade	137,771	681,536	20.21
Utilities	14,968	134,929	11.29
Communications and Other Services	150,578	1,137,387	13.23
Unallocated Sector	246,582	320,325	76.97

In this table, total intermediate input is defined to exclude intra-industry consumption.

**Table 5 – Total Intermediate Demand as a Percentage of Total Output, Niagara Region, 1967**  
(Valued at Producers' Prices in \$000)

Industry No.	Industry	Total Intermediate Demand	Total Output	Per
1	Agriculture, Forestry and Fishing	135,876	198,834	68.
2	Mining	10,525	20,746	50.
3	Meat and Poultry	13,072	46,806	27.
4	Dairy Products	10,689	30,035	35.
5	Fruit and Vegetable Products	20,350	65,017	31.
6	Grain Mills	35,056	51,836	67.
7	Biscuits and Bakeries	3,584	17,080	20.
8	Other Food Industries	19,070	45,222	42.
9	Soft Drinks, Wineries, Breweries, Distilleries and Tobacco Products	5,544	33,787	16.
10	Rubber Products	30,461	97,212	31.
11	Leather and Leather Products	843	7,348	11.
12	Cotton, Wool and Synthetic Textile Mills	35,756	45,888	77.
13	Other Primary Textile Mills	5,936	36,926	16.
14	Other Textile Industries	5,107	8,160	62.
15	Knitting Mills	683	19,572	3.
16	Clothing Industries	410	17,486	2.
17	Wood Industries	13,878	17,504	79.
18	Furniture and Fixtures	842	15,588	5.
19	Pulp and Paper Mills	71,235	95,506	74.
20	Paper Products	40,929	57,733	70.
21	Printing and Publishing	32,888	37,301	88.
22	Iron and Steel Mills	390,213	797,053	48.
23	Iron Foundries	38,662	38,800	99.
24	Other Primary Metals Industries	51,073	113,709	44.
25	Fabricated and Structural Metal	25,948	42,404	61.
26	Ornamental and Architectural Metal	6,057	17,457	34.
27	Metal Stamping, Pressing and Coating	44,880	89,526	50.
28	Wire and Wire Products	47,430	106,502	44.
29	Hardware, Tool and Cutlery	12,297	19,120	64.
30	Other Metal Fabricating Industries	116,612	222,208	52.
31	Miscellaneous Machinery	19,855	200,011	9.
32	Motor Vehicle Parts and Accessories	28,247	248,245	11.
33	Other Transportation Equipment	19,268	81,309	23.
34	Electrical Appliances	1,975	61,451	3.
35	Electrical Industrial Equipment	17,005	87,865	19.
36	Communication and Other Electrical Equipment	17,254	40,967	42.
37	Gypsum, Concrete, Stone and Clay Products	38,092	55,535	68.
38	Other Non-metallic Mineral Products	25,679	76,405	33.
39	Paint and Varnish	8,652	9,798	88.
40	Industrial Chemicals, Soap and Toilet Products	108,229	228,838	77.
41	Other Chemical Industries, Petroleum and Coal Products	30,106	52,052	57.
42	Scientific and Professional Equipment	734	2,399	30.
43	Miscellaneous Manufacturing Industries	10,586	35,329	29.
44	Construction, Maintenance and Repair	86,734	450,595	19.
45	Transportation, Storage and Trade	238,693	681,536	35.
46	Utilities	74,522	134,929	55.
47	Communications and Other Services	361,726	1,137,387	31.
48	Unallocated Sector	260,272	320,325	81.



## CONCLUSION

The interindustry model of the Niagara Region, as presented in this article, is considered a step further toward regionalization of the input-output model for the provincial economy. Without relying on any disaggregating method based on the technical structure of the provincial or national economy, the table was constructed on the basis of direct and actual data on the regional input structure and final demand patterns. It is hoped that this model, based on actual information, will provide a more reliable

foundation for impact analysis and studies of differential growth rates in the various regions than could be achieved using purely statistical disaggregation procedures.

The Niagara interflow table reveals in detail the complex industrial structure of the region where all major types of productive activity are represented. The intricate interdependence among various sectors is due to the fact that a great number of transactions are taking place between the productive sectors rather than between these industries and

the final demand sectors. Table (5) shows that more than 20 major industries delivered more than 40 per cent of their output to other industries for further processing. Moreover, a relatively large proportion of total inputs were supplied from domestic sources.

This model will be used in analyzing the structure of the regional economy and its market potential for different products and will provide a basis for a more rational approach for solving problems relating to public investment programs.

**Table I – The Inter-Industry Flow of Goods and Services, Niagara Region, 1967**  
*(Producers' Prices in Thousands of Dollars)*

Industry No.	Industry	Agriculture, Forestry and Fishing	Mining	Meat and Poultry
	<i>For the distribution of output of an industry, read the row for that industry.</i>			
	<i>For the composition of inputs to an industry, read the column for that industry.</i>			
Industry		1	2	3
1	Agriculture, Forestry and Fishing	18,281	0	26,775
2	Mining	0	40	3
3	Meat and Poultry	0	0	2,664
4	Dairy Products	0	0	0
5	Fruit and Vegetable Products	0	0	810
6	Grain Mills	28,669	0	24
7	Biscuits and Bakeries	0	0	0
8	Other Food Industries	340	0	132
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0
10	Rubber Products	1,282	0	0
11	Leather and Leather Products	0	0	0
12	Cotton, Wool and Synthetic Textile Mills	3	0	0
13	Other Primary Textile Mills	958	0	0
14	Other Textile Industries	10	0	0
15	Knitting Mills	0	0	0
16	Clothing Industries	0	0	0
17	Wood Industries	465	0	1
18	Furniture and Fixtures	0	0	0
19	Pulp and Paper Mills	0	0	10
20	Paper Products	146	0	606
21	Printing and Publishing	0	0	97
22	Iron and Steel Mills	0	1	0
23	Iron Foundries	0	0	0
24	Other Primary Metals Industries	0	0	0
25	Fabricated and Structural Metal	0	0	0
26	Ornamental and Architectural Metal	467	0	0
27	Metal Stamping, Pressing and Coating	1	1	472
28	Wire and Wire Products	576	0	0
29	Hardware, Tool and Cutlery	20	0	0
30	Other Metal Fabricating Industries	395	1,549	0
31	Miscellaneous Machinery	2,944	1	0
32	Motor Vehicle Parts and Accessories	0	494	0
33	Other Transportation Equipment	62	0	0
34	Electrical Appliances	0	0	0
35	Electrical Industrial Equipment	0	0	0
36	Communication and Other Electrical Equipment	70	0	0
37	Gypsum, Concrete, Stone and Clay Products	0	86	0
38	Other Non-metallic Mineral Products	0	0	0
39	Paint and Varnish	0	0	0
40	Industrial Chemicals, Soap and Toilet Products	1,664	3	9
41	Other Chemical Industries, Petroleum and Coal Products	8,380	96	255
42	Scientific and Professional Equipment	0	0	0
43	Miscellaneous Manufacturing Industries	19	0	0
44	Construction, Maintenance and Repair	5,072	529	76
45	Transportation, Storage and Trade	9,566	834	1,285
46	Utilities	1,592	574	140
47	Communications and Other Services	17,240	1,047	392
48	Unallocated Sector	1,872	1,907	990
49	<b>Total Intermediate Domestic Input (Rows 1 + ... + 48)</b>	100,094	7,162	34,741
50	Imports	14,622	2,203	3,872
51	Wages and Salaries	54,191	6,096	5,492
52	Other Value Added	29,927	5,285	2,701
53	<b>Total Value Added (Rows 51 + 52)</b>	84,118	11,381	8,193
54	<b>Total Input (Rows 49 + 50 + 53)</b>	198,834	20,746	46,806



Products	Grain Mills	Biscuits and Bakeries	Other Food Industries	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton, Wool and Synthetic Textile Mills	Other Primary Textile Mills	Other Textile Industries	Industry No.
	6	7	8	9	10	11	12	13	14	
20	24,892	56	15,911	3,134	0	0	1	0	0	1
6	12	2	0	0	6	0	2	1	0	2
95	950	110	326	0	0	44	0	0	0	3
230	68	198	80	0	0	0	0	0	0	4
786	444	1,749	7,489	49	0	0	0	0	0	5
412	358	2,485	1,984	0	0	0	0	0	0	6
3	0	4	0	0	0	0	0	0	0	7
346	1,330	546	1,627	445	0	0	95	1	0	8
64	0	0	261	3,739	0	0	0	0	0	9
0	0	0	0	0	12,137	670	0	268	18	10
0	0	0	0	0	0	288	0	0	0	11
0	0	0	0	0	2,487	183	14,245	3,401	391	12
0	0	0	0	0	37	0	745	1,301	244	13
0	127	0	0	0	175	0	120	1,097	1,035	14
0	0	0	0	0	0	0	124	16	0	15
0	0	0	0	0	0	6	0	0	45	16
0	0	0	0	0	0	2	16	0	0	17
0	0	0	0	0	0	0	0	0	0	18
0	0	0	416	118	7	45	184	70	2	19
078	1,171	505	892	1,318	221	97	171	573	1,123	20
509	1	98	121	60	6	41	2	37	0	21
0	0	0	0	0	0	0	0	0	0	22
0	0	0	0	0	0	0	0	0	0	23
0	0	0	0	157	4	0	0	0	0	24
0	0	0	0	0	0	0	0	0	0	25
0	0	0	0	0	0	0	0	0	0	26
163	0	0	33	389	26	0	0	0	0	27
0	0	0	0	0	575	5	0	0	0	28
0	0	0	0	0	126	38	0	0	95	29
0	0	0	0	0	2,229	0	0	0	0	30
0	0	0	0	0	0	0	0	0	0	31
0	0	0	0	0	0	0	0	0	0	32
0	0	0	0	0	0	0	0	0	4	33
0	0	0	0	0	0	0	418	0	17	34
0	0	0	0	0	0	0	0	0	0	35
0	0	0	0	0	1	0	0	0	0	36
0	0	0	0	0	54	0	0	0	0	37
140	0	0	18	1,778	12	0	0	0	0	38
0	0	0	0	0	137	10	0	0	0	39
130	130	34	89	67	12,699	10	1,007	800	76	40
3	94	187	207	144	232	22	1	24	129	41
0	0	0	0	0	0	0	0	0	0	42
0	0	0	0	0	0	118	0	1	15	43
155	89	36	53	110	166	11	183	159	9	44
301	3,855	636	995	1,020	1,621	250	860	1,788	184	45
210	150	5	116	110	525	27	393	202	21	46
712	687	609	510	754	2,515	258	718	871	162	47
182	2,155	817	1,415	2,936	4,384	554	1,352	1,432	521	48
745	36,513	8,077	32,543	16,328	40,382	2,679	20,637	12,042	4,091	49
438	5,371	1,906	4,063	2,823	13,442	2,106	6,755	10,760	1,501	50
503	4,585	5,670	4,348	6,312	14,940	2,455	11,030	8,566	1,812	51
331	5,367	1,427	4,268	8,324	28,448	108	7,466	5,558	756	52
834	9,952	7,097	8,616	14,636	43,388	2,563	18,496	14,124	2,568	53
017	51,836	17,080	45,222	33,787	97,212	7,348	45,888	36,926	8,160	54

**Table 1 – The Inter-Industry Flow of Goods and Services, Niagara Region, 1967 – Continued**  
*(Producers' Prices in Thousands of Dollars)*

Industry No.	Industry	Knitting Mills 15	Clothing Industries 16	Wood Industries 17
	<i>For the distribution of output of an industry, read the row for that industry.</i>			
	<i>For the composition of inputs to an industry, read the column for that industry.</i>			
1	Agriculture, Forestry and Fishing	0	0	0
2	Mining	0	1	0
3	Meat and Poultry	0	0	0
4	Dairy Products	0	0	0
5	Fruit and Vegetable Products	0	0	0
6	Grain Mills	0	0	0
7	Biscuits and Bakeries	0	0	0
8	Other Food Industries	0	0	0
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0
10	Rubber Products	0	0	0
11	Leather and Leather Products	0	2	0
12	Cotton, Wool and Synthetic Textile Mills	5,598	4,633	3
13	Other Primary Textile Mills	919	317	0
14	Other Textile Industries	177	94	0
15	Knitting Mills	517	0	0
16	Clothing Industries	0	0	0
17	Wood Industries	0	0	360
18	Furniture and Fixtures	0	0	352
19	Pulp and Paper Mills	10	92	584
20	Paper Products	242	138	13
21	Printing and Publishing	15	8	0
22	Iron and Steel Mills	0	0	1
23	Iron Foundries	0	0	0
24	Other Primary Metals Industries	0	0	8
25	Fabricated and Structural Metal	0	0	0
26	Ornamental and Architectural Metal	0	0	0
27	Metal Stamping, Pressing and Coating	0	0	38
28	Wire and Wire Products	0	0	32
29	Hardware, Tool and Cutlery	0	0	150
30	Other Metal Fabricating Industries	0	0	0
31	Miscellaneous Machinery	0	0	0
32	Motor Vehicle Parts and Accessories	0	0	0
33	Other Transportation Equipment	0	0	45
34	Electrical Appliances	0	0	0
35	Electrical Industrial Equipment	0	0	0
36	Communication and Other Electrical Equipment	0	0	0
37	Gypsum, Concrete, Stone and Clay Products	0	0	0
38	Other Non-metallic Mineral Products	0	0	323
39	Paint and Varnish	0	0	26
40	Industrial Chemicals, Soap and Toilet Products	334	0	23
41	Other Chemical Industries, Petroleum and Coal Products	1	170	0
42	Scientific and Professional Equipment	0	0	0
43	Miscellaneous Manufacturing Industries	37	168	113
44	Construction, Maintenance and Repair	32	14	42
45	Transportation, Storage and Trade	520	543	1,432
46	Utilities	87	48	94
47	Communications and Other Services	766	603	390
48	Unallocated Sector	748	632	529
49	<b>Total Intermediate Domestic Input (Rows 1 + ... + 48)</b>	<b>10,003</b>	<b>7,463</b>	<b>4,558</b>
50	Imports	2,481	1,438	6,183
51	Wages and Salaries	5,906	5,875	4,710
52	Other Value Added	1,182	2,710	2,053
53	<b>Total Value Added (Rows 51 + 52)</b>	<b>7,088</b>	<b>8,585</b>	<b>6,763</b>
54	<b>Total Input (Rows 49 + 50 + 53)</b>	<b>19,572</b>	<b>17,486</b>	<b>17,504</b>



	Paper Products	Printing and Publishing	Iron and Steel Mills	Iron Foundries	Other Primary Metals Industries	Fabricated and Structural Metal	Ornamental and Architec- tural Metal	Metal Stamping, Pressing and Coating	Wire and Wire Products	Industry No.
	20	21	22	23	24	25	26	27	28	
0	0	0	0	0	0	0	0	0	0	1
90	19	0	1,536	313	6	3	0	2	3	2
0	0	0	0	0	0	0	0	0	0	3
0	0	0	0	0	0	0	0	0	0	4
0	0	0	0	0	0	0	0	0	0	5
6	0	0	0	0	0	0	0	0	0	6
0	80	0	0	0	0	0	0	0	0	7
591	0	0	34	0	0	0	0	0	0	8
0	0	0	0	0	0	0	0	0	0	9
0	0	2	0	0	0	0	0	19	0	10
0	0	0	0	0	0	0	0	0	0	11
0	224	0	0	0	0	0	0	0	0	12
11	26	0	0	0	0	0	0	0	0	13
0	0	0	0	0	76	0	0	0	0	14
0	0	0	0	0	0	0	0	0	0	15
0	0	0	0	0	0	0	0	0	0	16
5	0	0	2,727	1	24	0	0	76	26	17
0	0	0	0	0	0	0	0	0	0	18
192	20,111	5,887	756	0	0	0	0	162	0	19
814	1,061	535	0	0	203	0	47	352	873	20
0	151	1,663	0	0	0	0	0	0	11	21
0	0	0	77,812	10,680	38,078	15,244	2,554	41,026	33,502	22
0	0	0	8,716	123	278	61	2	12	0	23
0	57	1	18,929	84	4,754	66	246	576	2,029	24
0	0	0	0	0	0	0	9	0	0	25
0	0	0	7	1	0	24	0	99	0	26
112	91	124	874	190	1,030	170	3,919	38	38	27
0	4	0	0	115	175	546	1,169	2,030	18,697	28
0	6	0	4	0	125	0	0	114	14	29
0	2	0	101	6,176	333	7,261	232	66	644	30
0	0	0	0	0	0	0	149	0	0	31
0	0	0	0	0	4,892	0	0	0	0	32
0	0	0	0	0	37	435	0	0	0	33
0	0	0	0	0	413	0	0	0	0	34
0	0	0	0	0	0	0	0	257	0	35
0	0	0	142	0	406	0	0	16	0	36
349	225	0	10,209	157	287	0	0	0	302	37
667	174	0	357	0	139	0	57	14	0	38
6	0	0	0	19	0	33	7	1,249	4	39
594	2,637	633	5,204	85	2,173	14	0	489	277	40
15	1,355	4	1,420	5	297	1	3	2	1	41
0	0	12	0	0	0	0	0	0	0	42
0	142	2	0	1	0	0	0	737	0	43
306	216	88	2,845	253	1,268	107	27	184	357	44
327	1,792	566	19,403	1,604	3,065	559	417	2,105	2,428	45
986	339	124	14,509	435	1,841	132	36	353	613	46
522	1,967	2,027	9,693	732	2,803	724	457	2,752	1,903	47
330	2,500	2,137	41,924	1,171	3,915	1,627	1,174	2,303	3,629	48
923	33,179	13,805	217,202	22,145	66,618	27,007	10,505	55,033	65,351	49
063	5,168	1,182	181,536	2,400	8,318	1,219	1,762	6,042	5,538	50
083	12,747	15,410	178,681	9,637	26,160	13,506	4,127	16,781	23,962	51
437	6,639	6,904	219,634	4,618	12,613	672	1,063	11,670	11,651	52
520	19,386	22,314	398,315	14,255	38,773	14,178	5,190	28,451	35,613	53
506	57,733	37,301	797,053	38,800	113,709	42,404	17,457	89,526	106,502	54

**Table I — The Inter-Industry Flow of Goods and Services, Niagara Region, 1967 — Continued**  
*(Producers' Prices in Thousands of Dollars)*

Industry No.	Industry	Hardware, Tool and Cutlery 29	Other Metal Fabricating Industries 30	Miscel- laneous Machinery 31	Motor Vehicle 32
1	Agriculture, Forestry and Fishing	0	0	0	
2	Mining	1	105	39	
3	Meat and Poultry	0	0	0	
4	Dairy Products	0	0	0	
5	Fruit and Vegetable Products	0	0	0	
6	Grain Mills	0	0	0	
7	Biscuits and Bakeries	0	0	0	
8	Other Food Industries	0	0	0	
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0	
10	Rubber Products	0	903	993	
11	Leather and Leather Products	0	0	0	
12	Cotton, Wool and Synthetic Textile Mills	0	0	0	
13	Other Primary Textile Mills	0	0	0	
14	Other Textile Industries	0	0	0	
15	Knitting Mills	0	0	0	
16	Clothing Industries	0	0	0	
17	Wood Industries	83	154	172	
18	Furniture and Fixtures	0	0	7	
19	Pulp and Paper Mills	21	22	173	
20	Paper Products	85	162	460	
21	Printing and Publishing	0	0	18	
22	Iron and Steel Mills	1,721	43,739	26,969	40
23	Iron Foundries	79	4,732	6,256	13
24	Other Primary Metals Industries	188	4,284	3,889	3
25	Fabricated and Structural Metal	0	15,783	0	
26	Ornamental and Architectural Metal	1	17	0	
27	Metal Stamping, Pressing and Coating	1,961	1,940	13,953	1
28	Wire and Wire Products	69	3,968	680	
29	Hardware, Tool and Cutlery	106	508	242	3
30	Other Metal Fabricating Industries	247	6,432	34,830	1
31	Miscellaneous Machinery	68	5,631	2,522	
32	Motor Vehicle Parts and Accessories	0	4,786	4,444	1
33	Other Transportation Equipment	0	373	0	
34	Electrical Appliances	0	1	0	
35	Electrical Industrial Equipment	656	2,158	938	
36	Communication and Other Electrical Equipment	0	307	33	
37	Gypsum, Concrete, Stone and Clay Products	44	41	0	
38	Other Non-metallic Mineral Products	0	0	98	
39	Paint and Varnish	31	303	718	
40	Industrial Chemicals, Soap and Toilet Products	1	151	19	
41	Other Chemical Industries, Petroleum and Coal Products	19	20	56	
42	Scientific and Professional Equipment	0	15	13	
43	Miscellaneous Manufacturing Industries	59	10	0	
44	Construction, Maintenance and Repair	40	741	777	
45	Transportation, Storage and Trade	482	5,192	8,330	
46	Utilities	90	800	805	
47	Communications and Other Services	743	7,050	6,947	
48	Unallocated Sector	1,531	11,490	7,218	
49	<b>Total Intermediate Domestic Input (Rows 1 + ... + 48)</b>	8,326	121,818	121,599	100
50	Imports	2,973	12,769	13,746	3
51	Wages and Salaries	6,464	63,740	49,735	7
52	Other Value Added	1,357	23,881	14,931	3
53	<b>Total Value Added (Rows 51 + 52)</b>	7,821	87,621	64,666	11
54	<b>Total Input (Rows 49 + 50 + 53)</b>	19,120	222,208	200,011	24



Transportation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communication and Other Electrical Equipment	Gypsum, Concrete, Stone and Clay Products	Other Non-metallic Mineral Products	Paint and Varnish	Industrial Chemicals, Soap and Toilet Products	Other Chemical Industries, Petroleum and Coal Products	Scientific and Professional Equipment	Industry No.
3	34	35	36	37	38	39	40	41	42	
3	0	3	0	1	0	0	11	1	0	1
4	1	1	4	2,001	24	11	630	851	0	2
0	0	0	0	0	0	0	1,092	0	0	3
0	0	0	0	202	0	0	5	0	0	4
0	0	0	0	0	0	0	6	0	0	5
0	0	0	0	0	0	0	4	0	0	6
0	0	0	0	0	0	0	0	0	0	7
0	0	0	0	112	0	203	10,714	170	0	8
0	0	0	0	0	0	0	0	0	0	9
573	82	0	430	0	0	9	124	0	4	10
0	0	0	0	0	0	0	69	0	2	11
5	35	41	38	0	167	0	0	0	3	12
1	0	0	0	0	0	0	0	0	1	13
2	0	0	28	0	2	0	0	0	0	14
0	0	0	0	0	0	0	0	0	1	15
0	0	0	0	0	0	0	0	0	0	16
27	0	67	41	84	51	0	1	33	1	17
0	0	0	0	0	0	0	0	0	12	18
3	4	2	1	2,516	134	0	5,326	0	24	19
15	1,281	298	179	674	1,027	23	7,535	1,732	10	20
0	0	0	2	0	20	0	8	53	0	21
4,414	10,343	7,316	51	393	279	0	16,319	5,048	48	22
833	0	840	103	0	217	0	0	0	2	23
685	621	536	1,003	3	4	0	816	0	50	24
42	0	0	0	0	0	0	0	0	9	25
0	0	0	0	0	0	0	0	0	0	26
65	22	70	49	44	54	397	3,670	22	62	27
42	3,048	4,632	348	507	44	0	0	0	4	28
59	0	38	0	1,811	0	0	0	0	1	29
845	0	3,204	458	72	64	0	44	0	31	30
3,367	1,206	0	0	0	0	0	0	0	2	31
112	0	218	0	0	0	0	0	0	0	32
2,290	0	0	806	0	0	0	0	110	0	33
51	361	0	0	0	0	0	0	0	0	34
3	7,839	91	969	0	0	0	0	0	4	35
129	187	0	10,427	0	102	0	6	0	407	36
1	62	0	41	907	5,325	0	353	0	0	37
63	13	373	1,026	853	9,836	25	990	195	55	38
217	868	45	7	11	0	268	220	79	2	39
25	370	24	641	432	1,076	2,560	35,174	22,139	16	40
43	93	23	30	31	1,144	265	8,385	2,455	14	41
23	43	6	0	0	0	0	0	0	16	42
2	0	7	0	4	0	0	459	0	7	43
366	116	179	78	302	382	21	1,262	323	6	44
666	1,824	2,062	927	3,160	2,080	301	7,576	1,532	47	45
324	179	469	80	452	4,549	28	6,795	355	5	46
915	2,145	3,141	1,894	2,003	2,472	432	7,523	839	93	47
2,073	3,337	4,062	1,548	4,048	5,403	855	17,329	2,075	189	48
5,288	34,080	27,748	21,209	20,623	34,456	5,398	132,446	38,012	1,128	49
655	8,113	6,942	3,351	10,996	9,460	905	19,787	8,935	338	50
2,090	13,240	28,939	10,777	13,620	24,230	1,811	29,150	4,594	806	51
3,276	6,018	24,236	5,630	10,296	8,259	1,684	47,455	511	127	52
3,366	19,258	53,175	16,407	23,916	32,489	3,495	76,605	5,105	933	53
3,309	61,451	87,865	40,967	55,535	76,405	9,798	228,838	52,052	2,399	54

**Table I — The Inter-Industry Flow of Goods and Services, Niagara Region, 1967 — Continued**  
*(Producers' Prices in Thousands of Dollars)*

Industry No.	For the distribution of output of an industry, read the row for that industry.  For the composition of inputs to an industry, read the column for that industry.	Miscel- laneous Manufac- turing Industries	Con- struction, Maintenance and Repair	Trans- portation, Storage and Trade	Utilities
		43	44	45	46
1	Agriculture, Forestry and Fishing	17	669	12,695	
2	Mining	508	3,763	45	
3	Meat and Poultry	3	0	116	
4	Dairy Products	0	0	257	
5	Fruit and Vegetable Products	0	0	0	
6	Grain Mills	0	0	290	
7	Biscuits and Bakeries	0	0	0	
8	Other Food Industries	4	0	33	
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	0	0	0	
10	Rubber Products	1,118	1,414	1,543	
11	Leather and Leather Products	27	6	7	
12	Cotton, Wool and Synthetic Textile Mills	95	51	748	
13	Other Primary Textile Mills	43	612	472	
14	Other Textile Industries	3	314	301	
15	Knitting Mills	25	0	0	
16	Clothing Industries	8	0	241	
17	Wood Industries	84	6,801	43	
18	Furniture and Fixtures	3	345	10	
19	Pulp and Paper Mills	193	1,447	1,065	
20	Paper Products	584	2,413	3,814	
21	Printing and Publishing	50	0	346	
22	Iron and Steel Mills	999	6,234	283	
23	Iron Foundries	26	3,126	17	
24	Other Primary Metals Industries	1,037	7,353	68	
25	Fabricated and Structural Metal	0	10,089	16	
26	Ornamental and Architectural Metal	0	5,441	0	
27	Metal Stamping, Pressing and Coating	356	4,884	498	
28	Wire and Wire Products	276	2,942	156	
29	Hardware, Tool and Cutlery	79	1,548	36	
30	Other Metal Fabricating Industries	125	21,238	801	
31	Miscellaneous Machinery	18	850	332	
32	Motor Vehicle Parts and Accessories	8	476	1,421	
33	Other Transportation Equipment	5	0	1,916	
34	Electrical Appliances	36	500	0	
35	Electrical Industrial Equipment	35	2,490	6	
36	Communication and Other Electrical Equipment	16	2,762	227	
37	Gypsum, Concrete, Stone and Clay Products	45	18,658	26	
38	Other Non-metallic Mineral Products	105	2,323	47	
39	Paint and Varnish	36	1,182	6	
40	Industrial Chemicals, Soap and Toilet Products	223	879	220	
41	Other Chemical Industries, Petroleum and Coal Products	1,736	396	303	
42	Scientific and Professional Equipment	0	46	6	
43	Miscellaneous Manufacturing Industries	1,349	1,134	396	
44	Construction, Maintenance and Repair	91	206	9,826	
45	Transportation, Storage and Trade	757	31,757	26,026	
46	Utilities	161	225	4,523	23
47	Communications and Other Services	1,622	20,896	51,608	0
48	Unallocated Sector	3,578	2,797	43,007	23
49	<b>Total Intermediate Domestic Input (Rows 1 + . . . + 48)</b>	15,484	168,267	163,797	38
50	Imports	5,075	66,417	45,746	23
51	Wages and Salaries	12,017	165,486	289,773	38
52	Other Value Added	2,753	50,425	182,220	57
53	<b>Total Value Added (Rows 51 + 52)</b>	14,770	215,911	471,993	95
54	<b>Total Input (Rows 49 + 50 + 53)</b>	35,329	450,595	681,536	133



ations and Other Services	Unallocated Sector	Total Intermediate Demand (Columns 1 + ... + 48)	Personal Con- sumption Expenditures	Investment	Changes in Inventories	Government Expenditures	Exports	Total Final Demand (Columns 50 + ... + 54)	Total Output (Columns 49 + 55)	Industry No.
47	48	49	50	51	52	53	54	55	56	
4,205	1,064	135,876	28,462	0	1,500	357	32,639	62,958	198,834	1
15	0	10,525	0	0	37	1,093	9,091	10,221	20,746	2
5,489	1,083	13,072	33,777	0	— 127	84	0	33,734	46,806	3
7,419	1,213	10,689	19,247	0	— 39	138	0	19,346	30,035	4
3,338	606	20,350	37,097	0	— 735	49	8,256	44,667	65,017	5
711	113	35,056	16,450	0	220	110	0	16,780	51,836	6
3,021	475	3,584	13,416	0	32	48	0	13,496	17,080	7
1,454	340	19,070	23,776	0	107	65	2,204	26,152	45,222	8
967	513	5,544	14,710	0	— 901	27	14,407	28,243	33,787	9
142	7,038	30,461	738	81	440	95	65,397	66,751	97,212	10
111	331	843	6,020	0	42	7	436	6,505	7,348	11
1,539	65	35,756	6,159	0	400	24	3,549	10,132	45,888	12
232	16	5,936	4,890	176	1,020	24	24,880	30,990	36,926	13
674	872	5,107	1,892	231	— 46	118	858	3,053	8,160	14
0	0	683	9,402	0	— 1,260	3	10,744	18,889	19,572	15
23	87	410	16,913	0	130	33	0	17,076	17,486	16
980	1	13,878	273	18	— 30	120	3,245	3,626	17,504	17
27	0	842	10,167	4,517	32	30	0	14,746	15,588	18
772	863	71,235	5,681	0	1,173	33	17,384	24,271	95,506	19
801	4,468	40,929	3,430	0	1,134	142	12,098	16,804	57,733	20
580	28,968	32,888	3,497	0	— 62	616	362	4,413	37,301	21
11	168	390,213	0	0	— 3,370	134	410,076	406,840	797,053	22
0	18	38,662	0	0	— 361	499	0	138	38,800	23
127	347	51,073	726	0	1,880	210	59,820	62,636	113,709	24
0	0	25,948	0	0	— 3,275	1,995	17,736	16,456	42,404	25
0	0	6,057	436	845	146	286	9,687	11,400	17,457	26
0	0	44,880	834	383	— 135	283	43,281	44,646	89,526	27
220	6,401	47,430	487	158	2,963	242	55,222	59,072	106,502	28
16	3,429	12,297	6,139	914	— 404	174	0	6,823	19,120	29
19	21,668	116,612	3,205	73,101	— 3,764	1,714	31,340	105,596	222,208	30
654	738	19,855	1,937	24,223	— 1,502	137	155,361	180,156	200,011	31
0	8,485	28,247	27,683	6,820	— 3,482	276	188,701	219,998	248,245	32
0	115	19,268	17,143	19,940	— 4,046	60	28,944	62,041	81,309	33
0	178	1,975	12,656	825	648	7	45,340	59,476	61,451	34
0	1,559	17,005	1,129	13,380	2,038	69	54,244	70,860	87,865	35
57	1,956	17,254	7,774	12,131	— 137	138	3,807	23,713	40,967	36
117	27	38,092	1,200	0	300	1,490	14,453	17,443	55,535	37
180	1,256	25,679	3,500	0	449	61	46,716	50,726	76,405	38
565	2,371	8,652	969	0	79	98	0	1,146	9,798	39
2,828	8,029	108,229	10,866	0	2,432	401	106,910	120,609	228,838	40
452	379	30,106	5,883	0	360	557	15,146	21,946	52,052	41
191	363	734	347	1,225	19	74	0	1,665	2,399	42
744	5,062	10,586	16,528	2,157	219	291	5,548	24,743	35,329	43
52,783	0	86,734	0	363,861	0	0	0	363,861	450,595	44
9,836	60,548	238,693	326,718	102,948	2,597	10,580	0	442,843	681,536	45
2,931	0	74,522	30,797	0	119	2,073	27,418	60,407	134,929	46
10,458	75,369	361,726	606,212	16,869	651	42,063	109,866	775,661	1,137,387	47
46,347	0	260,272	45,874	0	906	11,631	1,642	60,053	320,325	48
261,036	246,582	2,573,535	0	0	— 0	0	0	0	0	49
36,721	73,743	679,041	565,960	565,960	113	15,201	0	684,550	1,363,591	50
260,905	0	1,598,088	0	0	0	253,147	0	253,147	1,851,235	51
78,725	0	1,466,678	0	0	0	0	0	0	1,466,678	52
339,630	0	3,064,766	0	0	0	253,147	0	253,147	3,317,913	53
37,387	320,325	6,317,342	1,951,000	748,305	— 1,716	347,107	1,636,808	4,681,504	0	54

**Table II – Direct Requirements Table, Niagara Region, 1967**  
(Producers' Prices in Dollars)

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Fruit and Vegetable Products	
	Industry	1	2	3	4	5	
1	Agriculture, Forestry and Fishing	.091941	.0	.572042	.550591	.178722	.480
2	Mining	.0	.001928	.000064	.000033	.000092	.000
3	Meat and Poultry	.0	.0	.056916	.0	.018380	.018
4	Dairy Products	.0	.0	.0	.033860	.003538	.003
5	Fruit and Vegetable Products	.0	.0	.017305	.002430	.088992	.008
6	Grain Mills	.144186	.0	.000513	.0	.006337	.006
7	Biscuits and Bakeries	.0	.0	.0	.000033	.000046	.0
8	Other Food Industries	.001710	.0	.002820	.001765	.013012	.023
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.0	.0	.0	.0	.000984	.0
10	Rubber Products	.006448	.0	.0	.0	.0	.0
11	Leather and Leather Products	.0	.0	.0	.0	.0	.0
12	Cotton, Wool and Synthetic Textile Mills	.000015	.0	.0	.0	.0	.0
13	Other Primary Textile Mills	.004818	.0	.0	.0	.0	.0
14	Other Textile Industries	.000050	.0	.0	.0	.0	.000
15	Knitting Mills	.0	.0	.0	.0	.0	.0
16	Clothing Industries	.0	.0	.0	.0	.0	.0
17	Wood Industries	.002339	.0	.000021	.0	.0	.0
18	Furniture and Fixtures	.0	.0	.0	.0	.0	.0
19	Pulp and Paper Mills	.0	.0	.000214	.0	.0	.0
20	Paper Products	.000734	.0	.012947	.023339	.031961	.023
21	Printing and Publishing	.0	.0	.002072	.0	.007829	.000
22	Iron and Steel Mills	.0	.000048	.0	.0	.0	.0
23	Iron Foundries	.0	.0	.0	.0	.0	.0
24	Other Primary Metals Industries	.0	.0	.0	.0	.0	.0
25	Fabricated and Structural Metal	.0	.0	.0	.0	.0	.0
26	Ornamental and Architectural Metal	.002349	.0	.0	.0	.0	.0
27	Metal Stamping, Pressing and Coating	.000005	.000048	.010084	.000266	.079410	.0
28	Wire and Wire Products	.002897	.0	.0	.0	.0	.0
29	Hardware, Tool and Cutlery	.000101	.0	.0	.0	.0	.0
30	Other Metal Fabricating Industries	.001987	.074665	.0	.0	.0	.0
31	Miscellaneous Machinery	.014806	.000048	.0	.0	.0	.0
32	Motor Vehicle Parts and Accessories	.0	.023812	.0	.0	.0	.0
33	Other Transportation Equipment	.000312	.0	.0	.0	.0	.0
34	Electrical Appliances	.0	.0	.0	.0	.0	.0
35	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
36	Communication and Other Electrical Equipment	.000352	.0	.0	.0	.0	.0
37	Gypsum, Concrete, Stone and Clay Products	.0	.004145	.0	.0	.0	.0
38	Other Non-metallic Mineral Products	.0	.0	.0	.003130	.048295	.0
39	Paint and Varnish	.0	.0	.0	.0	.0	.0
40	Industrial Chemicals, Soap and Toilet Products	.008369	.000145	.000192	.000266	.001999	.000
41	Other Chemical Industries, Petroleum and Coal Products	.042146	.004627	.005448	.000233	.000046	.000
42	Scientific and Professional Equipment	.0	.0	.0	.0	.0	.0
43	Miscellaneous Manufacturing Industries	.000096	.0	.0	.0	.0	.0
44	Construction, Maintenance and Repair	.025509	.025499	.001624	.002264	.002384	.000
45	Transportation, Storage and Trade	.048110	.040201	.027454	.013085	.035391	.070
46	Utilities	.008007	.027668	.002991	.004828	.003230	.000
47	Communications and Other Services	.086705	.050468	.008375	.017813	.026332	.010
48	Unallocated Sector	.009415	.091921	.021151	.036457	.064322	.040
49	Imports	.073539	.106189	.082724	.035658	.099020	.100
50	Wages and Salaries	.272544	.293840	.117335	.256767	.176923	.080
51	Other Value Added	.150512	.254748	.057706	.017180	.112755	.100
52	<b>Total</b>	1.000000	1.000000	1.000000	1.000000	1.000000	1.000

Note: Figures may not add to total due to rounding.



Biscuits and Bakeries	Other Food Industries	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton, Wool and Synthetic Textile Mills	Other Primary Textile Mills	Other Textile Industries	Knitting Mills	Clothing Industries	Industry No.
7	8	9	10	11	12	13	14	15	16	
03279	.351842	.092758	.0	.0	.000022	.0	.0	.0	.0	1
00117	.0	.0	.000062	.0	.000044	.000027	.0	.0	.000057	2
06440	.007209	.0	.0	.005988	.0	.0	.0	.0	.0	3
11593	.001769	.0	.0	.0	.0	.0	.0	.0	.0	4
02400	.165605	.001450	.0	.0	.0	.0	.0	.0	.0	5
45492	.043872	.0	.0	.0	.0	.0	.0	.0	.0	6
00234	.0	.0	.0	.0	.0	.0	.0	.0	.0	7
31967	.035978	.013171	.0	.0	.002070	.000027	.0	.0	.0	8
	.005772	.110664	.0	.0	.0	.0	.0	.0	.0	9
	.0	.0	.124851	.091181	.0	.007258	.002206	.0	.0	10
	.0	.0	.0	.039194	.0	.0	.0	.0	.000114	11
	.0	.0	.025583	.024905	.310430	.092103	.047917	.286021	.264955	12
	.0	.0	.000381	.0	.016235	.035233	.029902	.046955	.018129	13
	.0	.0	.001800	.0	.002615	.029708	.126838	.009044	.005376	14
	.0	.0	.0	.0	.002702	.000433	.0	.026415	.0	15
	.0	.0	.0	.000817	.0	.0	.005515	.0	.0	16
	.0	.0	.0	.000272	.000349	.0	.0	.0	.0	17
	.0	.0	.0	.0	.0	.0	.0	.0	.0	18
29567	.009199	.003492	.000072	.006124	.004010	.001896	.000245	.000511	.005261	19
	.019725	.039009	.002273	.013201	.003726	.015518	.137623	.012365	.007892	20
05738	.002676	.001776	.000062	.005580	.000044	.001002	.0	.000766	.000458	21
	.0	.0	.0	.0	.0	.0	.0	.0	.0	22
	.0	.0	.0	.0	.0	.0	.0	.0	.0	23
	.0	.004647	.000041	.0	.0	.0	.0	.0	.0	24
	.0	.0	.0	.0	.0	.0	.0	.0	.0	25
	.0	.0	.0	.0	.0	.0	.0	.0	.0	26
	.000730	.011513	.000267	.0	.0	.0	.0	.0	.0	27
	.0	.0	.005915	.000680	.0	.0	.0	.0	.0	28
	.0	.0	.001296	.005171	.0	.0	.011642	.0	.0	29
	.0	.0	.022929	.0	.0	.0	.0	.0	.0	30
	.0	.0	.0	.0	.0	.0	.0	.0	.0	31
	.0	.0	.0	.0	.0	.0	.0	.0	.0	32
	.0	.0	.0	.0	.0	.0	.000490	.0	.0	33
	.0	.0	.0	.0	.009109	.0	.002083	.0	.0	34
	.0	.0	.0	.0	.0	.0	.0	.0	.0	35
	.0	.0	.000010	.0	.0	.0	.0	.0	.0	36
	.0	.0	.000555	.0	.0	.0	.0	.0	.0	37
	.000398	.052624	.000123	.0	.0	.0	.0	.0	.0	38
	.0	.0	.001409	.001361	.0	.0	.0	.0	.0	39
01991	.001968	.001983	.130632	.001361	.021945	.021665	.009314	.017065	.0	40
010948	.004577	.004262	.002387	.002994	.000022	.000650	.015809	.000051	.009722	41
	.0	.0	.0	.0	.0	.0	.0	.0	.0	42
	.0	.0	.0	.016059	.0	.000027	.001838	.001890	.009608	43
002108	.001172	.003256	.001708	.001497	.003988	.004306	.001103	.001635	.000801	44
037237	.022003	.030189	.016675	.034023	.018741	.048421	.022549	.026569	.031053	45
000293	.002565	.003256	.005401	.003674	.008564	.005470	.002574	.004445	.002745	46
035656	.011278	.022316	.025871	.035112	.015647	.023588	.019853	.039138	.034485	47
047834	.031290	.086897	.045097	.075395	.029463	.038780	.063848	.038218	.036143	48
11593	.089846	.083553	.138275	.286609	.147206	.291394	.183946	.126763	.082237	49
31967	.096148	.186817	.153685	.334105	.240368	.231977	.222059	.301758	.335983	50
083548	.094379	.246367	.292639	.014698	.162700	.150517	.092647	.060392	.154981	51
000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	52

**Table II – Direct Requirements Table, Niagara Region, 1967 – Continued**  
*(Producers' Prices in Dollars)*

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Wood Industries	Furniture and Fixtures	Pulp and Paper Mills	Paper Products	Printing and Publishing	
		17	18	19	20	21	
1	Agriculture, Forestry and Fishing	.0	.0	.0	.0	.0	.0
2	Mining	.0	.0	.000942	.000329	.0	.00
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.0	.0
5	Fruit and Vegetable Products	.0	.0	.0	.0	.0	.0
6	Grain Mills	.0	.0	.000063	.0	.0	.0
7	Biscuits and Bakeries	.0	.0	.0	.001386	.0	.0
8	Other Food Industries	.0	.0	.006188	.0	.0	.00
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.0	.0	.0	.0	.0	.0
10	Rubber Products	.0	.0	.0	.0	.000054	.0
11	Leather and Leather Products	.0	.0	.0	.0	.0	.0
12	Cotton, Wool and Synthetic Textile Mills	.000171	.003208	.0	.003880	.0	.0
13	Other Primary Textile Mills	.0	.000064	.000115	.000450	.0	.0
14	Other Textile Industries	.0	.0	.0	.0	.0	.0
15	Knitting Mills	.0	.0	.0	.0	.0	.0
16	Clothing Industries	.0	.0	.0	.0	.0	.0
17	Wood Industries	.020567	.089364	.000052	.0	.0	.00
18	Furniture and Fixtures	.020110	.005517	.0	.0	.0	.0
19	Pulp and Paper Mills	.033364	.001475	.316127	.348345	.157824	.00
20	Paper Products	.000743	.003528	.018994	.018378	.014343	.0
21	Printing and Publishing	.0	.000064	.0	.002615	.044583	.0
22	Iron and Steel Mills	.000057	.021555	.0	.0	.0	.09
23	Iron Foundries	.0	.0	.0	.0	.0	.01
24	Other Primary Metals Industries	.000457	.0	.0	.000987	.000027	.02
25	Fabricated and Structural Metal	.0	.0	.0	.0	.0	.0
26	Ornamental and Architectural Metal	.0	.0	.0	.0	.0	.00
27	Metal Stamping, Pressing and Coating	.002171	.147293	.001173	.001576	.003324	.00
28	Wire and Wire Products	.001828	.007121	.0	.000069	.0	.0
29	Hardware, Tool and Cutlery	.008569	.013729	.0	.000104	.0	.00
30	Other Metal Fabricating Industries	.0	.104119	.0	.000035	.0	.00
31	Miscellaneous Machinery	.0	.079997	.0	.0	.0	.0
32	Motor Vehicle Parts and Accessories	.0	.0	.0	.0	.0	.0
33	Other Transportation Equipment	.002571	.0	.0	.0	.0	.0
34	Electrical Appliances	.0	.0	.0	.0	.0	.0
35	Electrical Industrial Equipment	.0	.0	.0	.0	.0	.0
36	Communication and Other Electrical Equipment	.0	.0	.0	.0	.0	.0
37	Gypsum, Concrete, Stone and Clay Products	.0	.0	.003654	.003897	.0	.0
38	Other Non-metallic Mineral Products	.018453	.003143	.006984	.003014	.0	.0
39	Paint and Varnish	.001485	.005389	.000063	.0	.0	.0
40	Industrial Chemicals, Soap and Toilet Products	.001314	.000192	.048102	.045676	.016970	.0
41	Other Chemical Industries, Petroleum and Coal Products	.0	.005325	.000157	.023470	.000107	.0
42	Scientific and Professional Equipment	.0	.0	.0	.0	.000322	.0
43	Miscellaneous Manufacturing Industries	.006456	.0	.0	.002460	.000054	.0
44	Construction, Maintenance and Repair	.002399	.001155	.003204	.003741	.002359	.0
45	Transportation, Storage and Trade	.081810	.026495	.034836	.031039	.015174	.0
46	Utilities	.005370	.001283	.031265	.005872	.003324	.0
47	Communications and Other Services	.022281	.016295	.015936	.034071	.054342	.0
48	Unallocated Sector	.030222	.020272	.034867	.043303	.057291	.0
49	Imports	.353234	.152553	.063483	.089516	.031688	.2
50	Wages and Salaries	.269081	.216449	.273103	.220792	.413126	.2
51	Other Value Added	.117287	.074416	.140693	.114995	.185089	.2
52	<b>Total</b>	1.000000	1.000000	1.000000	1.000000	1.000000	1.0

Note: Figures may not add to total due to rounding.



Iron Foundries	Other Primary Metals Industries	Fabricated and Structural Metal	Ornamental and Archi- tectural Metal	Metal Stamping, Pressing and Coating	Wire and Wire Products	Hardware, Tool and Cutlery	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicle Parts and Accessories	Industry No.
23	24	25	26	27	28	29	30	31	32	
08067	.0	.0	.0	.0	.0	.0	.0	.0	.0	1
	.000053	.000071	.0	.000022	.000028	.000052	.000473	.000195	.001861	2
	.0	.0	.0	.0	.0	.0	.0	.0	.0	3
	.0	.0	.0	.0	.0	.0	.0	.0	.0	4
	.0	.0	.0	.0	.0	.0	.0	.0	.0	5
	.0	.0	.0	.0	.0	.0	.0	.0	.0	6
	.0	.0	.0	.0	.0	.0	.0	.0	.0	7
	.0	.0	.0	.0	.0	.0	.0	.0	.0	8
	.0	.0	.0	.0	.0	.0	.0	.0	.0	9
	.0	.0	.0	.000212	.0	.0	.004064	.004965	.006816	10
	.0	.0	.0	.0	.0	.0	.0	.0	.0	11
	.0	.0	.0	.0	.0	.0	.0	.0	.007054	12
	.0	.0	.0	.0	.0	.0	.0	.0	.0	13
	.000668	.0	.0	.0	.0	.0	.0	.0	.0	14
	.0	.0	.0	.0	.0	.0	.0	.0	.0	15
	.0	.0	.0	.0	.0	.0	.0	.0	.0	16
00026	.000211	.0	.0	.000849	.000244	.004341	.000693	.000860	.000640	17
	.0	.0	.0	.0	.0	.0	.0	.000035	.0	18
	.0	.0	.0	.001810	.0	.001098	.000099	.000865	.0	19
	.001785	.0	.002692	.003932	.008197	.004446	.000729	.002300	.001744	20
75258	.0	.0	.0	.0	.000103	.0	.0	.000090	.0	21
	.334872	.359494	.146302	.458258	.314567	.090010	.196838	.134838	.163725	22
	.03170	.002445	.001439	.000115	.000134	.0	.004132	.031278	.053258	23
	.02165	.041808	.001556	.014092	.006434	.019051	.009833	.019279	.012693	24
	.0	.0	.000516	.0	.0	.0	.071028	.0	.0	25
00026	.0	.000566	.0	.001106	.0	.000052	.000077	.0	.0	26
	.04897	.009058	.004009	.224494	.000424	.000357	.102563	.008731	.069761	27
	.02964	.001539	.012876	.066965	.022675	.175555	.003609	.017857	.003400	28
		.001099	.0	.001273	.000131	.005544	.002286	.001210	.014171	29
	.59175	.002929	.171234	.013290	.000737	.006047	.012918	.028946	.174140	30
	.0	.0	.008535	.0	.0	.003556	.025341	.012609	.0	31
	.043022	.0	.0	.0	.0	.0	.021538	.022219	.007698	32
	.000325	.010258	.0	.0	.0	.0	.001679	.0	.000282	33
	.003632	.0	.0	.0	.0	.0	.000005	.0	.0	34
	.0	.0	.0	.002871	.0	.034310	.009712	.004690	.0	35
04046	.003571	.0	.0	.000179	.0	.0	.001382	.000165	.000012	36
	.002524	.0	.0	.0	.002836	.002301	.000185	.0	.003126	37
	.001222	.0	.003265	.000156	.0	.0	.0	.000490	.005716	38
00490	.0	.000778	.000401	.013951	.000038	.001621	.001364	.003590	.000596	39
	.02191	.019110	.000330	.0	.005462	.002601	.000052	.000680	.000095	40
00129	.002612	.000024	.000172	.000022	.000009	.000994	.000090	.000280	.004488	41
	.0	.0	.0	.0	.0	.0	.000068	.000065	.0	42
00026	.0	.0	.0	.008232	.0	.003086	.000045	.0	.0	43
	.06521	.011151	.002523	.001547	.002055	.003352	.002092	.003335	.003885	44
41340	.026955	.013183	.023887	.023513	.022798	.025209	.023365	.041648	.035251	45
	.11211	.016190	.003113	.002062	.003943	.005756	.004707	.003600	.004025	46
18866	.024651	.017074	.026179	.030740	.017868	.038860	.031727	.034733	.015114	47
	.30180	.034430	.038369	.067251	.025724	.034074	.080073	.051708	.038599	48
61856	.073152	.028747	.100934	.067489	.051999	.155492	.057464	.068726	.144764	49
	.48376	.230061	.318508	.236409	.187443	.224991	.338075	.286848	.295047	50
19021	.110923	.015848	.060892	.130353	.109397	.070973	.107471	.074651	.155947	51
00000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	52

**Table II — Direct Requirements Table, Niagara Region, 1967 — Continued**  
*(Producers' Prices in Dollars)*

Industry No.	For the composition of inputs to an industry, read the column for that industry.	Other Transportation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communication and Other Electrical Equipment	Gypsum, Concrete, Stone and Clay Products	Other Non- Metallic Products
	Industry	33	34	35	36	37	
1	Agriculture, Forestry and Fishing	.000037	.0	.000034	.0	.000018	.0
2	Mining	.000049	.000016	.000011	.000098	.036031	.00
3	Meat and Poultry	.0	.0	.0	.0	.0	.0
4	Dairy Products	.0	.0	.0	.0	.003637	.0
5	Fruit and Vegetable Products	.0	.0	.0	.0	.0	.0
6	Grain Mills	.0	.0	.0	.0	.0	.0
7	Biscuits and Bakeries	.0	.0	.0	.0	.0	.0
8	Other Food Industries	.0	.0	.0	.0	.002017	.0
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.0	.0	.0	.0	.0	.0
10	Rubber Products	.007047	.001334	.0	.010496	.0	.0
11	Leather and Leather Products	.0	.0	.0	.0	.0	.0
12	Cotton, Wool and Synthetic Textile Mills	.000061	.000570	.000467	.000928	.0	.00
13	Other Primary Textile Mills	.000012	.0	.0	.0	.0	.0
14	Other Textile Industries	.000025	.0	.0	.000683	.0	.00
15	Knitting Mills	.0	.0	.0	.0	.0	.0
16	Clothing Industries	.0	.0	.0	.0	.0	.0
17	Wood Industries	.000332	.0	.000763	.001001	.001513	.00
18	Furniture and Fixtures	.0	.0	.0	.0	.0	.0
19	Pulp and Paper Mills	.000037	.000065	.000023	.000024	.045305	.00
20	Paper Products	.000184	.020846	.003392	.004369	.012136	.01
21	Printing and Publishing	.0	.0	.0	.000049	.0	.00
22	Iron and Steel Mills	.128079	.168313	.083264	.001245	.007077	.00
23	Iron Foundries	.010245	.0	.009560	.002514	.0	.00
24	Other Primary Metals Industries	.008425	.010106	.006100	.024483	.000054	.00
25	Fabricated and Structural Metal	.000517	.0	.0	.0	.0	.0
26	Ornamental and Architectural Metal	.0	.0	.0	.0	.0	.0
27	Metal Stamping, Pressing and Coating	.000799	.000358	.000797	.001196	.000792	.00
28	Wire and Wire Products	.000517	.049600	.052717	.008495	.009129	.00
29	Hardware, Tool and Cutlery	.000726	.0	.000432	.0	.032610	.0
30	Other Metal Fabricating Industries	.059587	.0	.036465	.011180	.001296	.00
31	Miscellaneous Machinery	.041410	.019625	.0	.0	.0	.0
32	Motor Vehicle Parts and Accessories	.013676	.0	.002481	.0	.0	.0
33	Other Transportation Equipment	.188048	.0	.0	.019674	.0	.0
34	Electrical Appliances	.000627	.005875	.0	.0	.0	.0
35	Electrical Industrial Equipment	.000037	.127565	.001036	.023653	.0	.0
36	Communication and Other Electrical Equipment	.001587	.003043	.0	.254522	.0	.00
37	Gypsum, Concrete, Stone and Clay Products	.000012	.001009	.0	.001001	.016332	.00
38	Other Non-metallic Mineral Products	.000775	.000212	.004245	.025045	.015360	.1
39	Paint and Varnish	.002669	.014125	.000512	.000171	.000198	.0
40	Industrial Chemicals, Soap and Toilet Products	.000307	.006021	.000273	.015647	.007779	.0
41	Other Chemical Industries, Petroleum and Coal Products	.000529	.001513	.000262	.000732	.000558	.0
42	Scientific and Professional Equipment	.000283	.000700	.000068	.0	.0	.0
43	Miscellaneous Manufacturing Industries	.000025	.0	.000080	.0	.000072	.0
44	Construction, Maintenance and Repair	.004501	.001888	.002037	.001904	.005438	.0
45	Transportation, Storage and Trade	.032788	.029682	.023468	.022628	.056901	.0
46	Utilities	.003985	.002913	.005338	.001953	.008139	.00
47	Communications and Other Services	.023552	.034906	.035748	.046232	.036067	.00
48	Unallocated Sector	.025495	.054303	.046230	.037787	.072891	.00
49	Imports	.069549	.132024	.079008	.081798	.198001	.1
50	Wages and Salaries	.271680	.215456	.329358	.263065	.245251	.3
51	Other Value Added	.101785	.097932	.275832	.137428	.185397	.1
52	<b>Total</b>	1.000000	1.000000	1.000000	1.000000	0.000000	1.0

Note: Figures may not add to total due to rounding.



Paint and Varnish	Industrial Chemicals, Soap and Toilet Products	Other Chemical Industries, Petroleum and Coal Products	Scientific and Professional Equipment	Miscellaneous Manufacturing Industries	Construction, Maintenance and Repair	Transportation, Storage and Trade	Utilities	Communications and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	
1123	.000048	.000019	.0	.000481	.001485	.018627	.0	.003697	.003322	1
	.002753	.016349	.0	.014379	.008351	.000066	.000104	.000013	.0	2
	.004772	.0	.0	.000085	.0	.000170	.0	.004826	.003381	3
	.000022	.0	.0	.0	.0	.000377	.0	.006523	.003787	4
	.000026	.0	.0	.0	.0	.0	.0	.002935	.001892	5
	.000017	.0	.0	.0	.0	.000426	.0	.000625	.000353	6
0719	.0	.0	.0	.0	.0	.0	.0	.002656	.001483	7
	.046819	.003266	.0	.000113	.0	.000048	.0	.001278	.001061	8
0919	.0	.0	.0	.0	.0	.0	.0	.000850	.001601	9
	.000542	.0	.001667	.031645	.003138	.002264	.0	.000125	.021971	10
	.000302	.0	.000834	.000764	.000013	.000010	.0	.000098	.001033	11
	.0	.0	.001251	.002689	.000113	.001098	.0	.001353	.000203	12
	.0	.0	.000417	.001217	.001358	.000693	.0	.000204	.000050	13
	.0	.0	.0	.000085	.000697	.000442	.0	.000593	.002722	14
	.0	.0	.000417	.000708	.0	.0	.0	.0	.0	15
	.0	.0	.0	.000226	.0	.000354	.0	.000020	.000272	16
	.000004	.000634	.000417	.002378	.015093	.000063	.0	.000862	.000003	17
	.0	.0	.005002	.000085	.000766	.000015	.0	.000024	.0	18
2347	.023274	.0	.010004	.005463	.003211	.001563	.0	.000679	.002694	19
	.032927	.033274	.004168	.016530	.005355	.005596	.0	.000704	.013948	20
	.000035	.001018	.0	.001415	.0	.000508	.000163	.000510	.090433	21
	.071312	.096980	.020008	.028277	.013835	.000415	.0	.000010	.000524	22
	.0	.0	.000834	.000736	.006937	.000025	.0	.0	.000056	23
	.003566	.0	.020842	.029353	.016318	.000100	.0	.000112	.001083	24
0518	.0	.0	.003752	.0	.022390	.000023	.0	.0	.0	25
	.0	.0	.0	.0	.012075	.0	.0	.0	.0	26
	.016038	.000423	.025844	.010077	.010839	.000731	.0	.0	.0	27
	.0	.0	.001667	.007812	.006529	.000229	.0	.000193	.019983	28
	.0	.0	.000417	.002236	.003435	.000053	.0	.000014	.010705	29
	.000192	.0	.012922	.003538	.047133	.001175	.0	.000017	.067644	30
	.0	.0	.000834	.000509	.001886	.000487	.000934	.000575	.002304	31
	.0	.0	.0	.000226	.001056	.002085	.0	.0	.026489	32
	.0	.002113	.0	.000142	.0	.002811	.0	.0	.000359	33
	.0	.0	.0	.001019	.001110	.0	.0	.0	.000556	34
2552	.0	.0	.001667	.000991	.005526	.000009	.0	.0	.004867	35
	.000026	.0	.169654	.000453	.006130	.000333	.0	.000050	.006106	36
	.001543	.0	.0	.001274	.041407	.000038	.0	.000103	.000084	37
	.004326	.003746	.022926	.002972	.005155	.000069	.0	.000158	.003921	38
	.000961	.001518	.000834	.001019	.002623	.000009	.0	.000497	.007402	39
	.153707	.425325	.006669	.006312	.001951	.000323	.000245	.002486	.025065	40
	.036642	.047164	.005836	.049138	.000879	.000445	.000074	.000397	.001183	41
	.0	.0	.006669	.0	.000102	.000009	.0	.000168	.001133	42
	.002006	.0	.002918	.038184	.002517	.000581	.0	.000654	.015803	43
	.005515	.006205	.002501	.002576	.000457	.014417	.038605	.046407	.0	44
0721	.033106	.029432	.019591	.021427	.070478	.038187	.007982	.008648	.189021	45
	.029693	.006820	.002084	.004557	.000499	.006636	.175507	.002577	.0	46
4091	.032875	.016118	.038766	.045911	.046374	.075723	.046106	.097116	.235289	47
7263	.075726	.039864	.078783	.101277	.006207	.063103	.016720	.040749	.0	48
2366	.086467	.171655	.140892	.143650	.147398	.067122	.020685	.032285	.230213	49
4834	.127383	.088258	.335973	.340145	.367261	.425176	.265295	.229390	.0	50
1872	.207374	.009817	.052939	.077925	.111908	.267367	.427580	.508820	.0	51
0000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	1.000000	52

**Table III – Total Requirements Table, Niagara Region, 1967**  
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Agriculture, Forestry, and Fishing	Mining	Meat and Poultry	Dairy Products	Fruit and Vegetable Products	
	Industry	1	2	3	4	5	
1	Agriculture, Forestry and Fishing	1.205444	.004900	.739859	.690472	.270382	.61
2	Mining	.001638	1.002837	.001318	.001135	.001093	.00
3	Meat and Poultry	.004740	.001049	1.064003	.003193	.023650	.02
4	Dairy Products	.001496	.001214	.001316	1.036368	.005367	.00
5	Fruit and Vegetable Products	.004131	.000821	.023578	.005824	1.102613	.01
6	Grain Mills	.175694	.000962	.108756	.100853	.047357	1.09
7	Biscuits and Bakeries	.000474	.000450	.000428	.000510	.000564	.00
8	Other Food Industries	.009690	.000913	.009880	.007983	.018568	.03
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.000288	.000312	.000306	.000302	.001639	.00
10	Rubber Products	.010751	.004035	.007578	.007460	.005319	.00
11	Leather and Leather Products	.000080	.000140	.000089	.000101	.000138	.00
12	Cotton, Wool and Synthetic Textile Mills	.001929	.000946	.001486	.001498	.001393	.00
13	Other Primary Textile Mills	.006261	.000195	.003905	.003651	.001549	.00
14	Other Textile Industries	.001126	.000519	.000838	.000836	.000694	.00
15	Knitting Mills	.000009	.000004	.000007	.000007	.000007	.00
16	Clothing Industries	.000055	.000063	.000058	.000055	.000069	.00
17	Wood Industries	.003828	.000891	.002520	.002334	.001420	.00
18	Furniture and Fixtures	.000115	.000049	.000079	.000074	.000048	.00
19	Pulp and Paper Mills	.009618	.006243	.016534	.020571	.030033	.02
20	Paper Products	.011141	.003723	.023251	.032763	.044207	.03
21	Printing and Publishing	.004489	.010978	.008308	.006987	.019588	.00
22	Iron and Steel Mills	.023824	.037203	.024329	.016962	.059080	.01
23	Iron Foundries	.001567	.004308	.001234	.001156	.001593	.00
24	Other Primary Metals Industries	.002533	.004259	.002176	.001909	.003361	.00
25	Fabricated and Structural Metal	.001796	.007151	.001385	.001405	.001193	.00
26	Ornamental and Architectural Metal	.003335	.000437	.002110	.001973	.000958	.00
27	Metal Stamping, Pressing and Coating	.004157	.002524	.015331	.003353	.089874	.00
28	Wire and Wire Products	.006659	.005588	.005368	.005146	.006879	.00
29	Hardware, Tool and Cutlery	.000984	.002236	.001024	.001134	.001707	.00
30	Other Metal Fabricating Industries	.012252	.089908	.010203	.010706	.010960	.01
31	Miscellaneous Machinery	.018811	.002942	.011747	.011037	.004796	.00
32	Motor Vehicle Parts and Accessories	.002274	.029532	.002425	.002679	.003614	.00
33	Other Transportation Equipment	.001055	.000658	.000838	.000744	.000600	.00
34	Electrical Appliances	.000102	.000130	.000091	.000096	.000110	.00
35	Electrical Industrial Equipment	.000744	.001773	.000723	.000750	.001123	.00
36	Communication and Other Electrical Equipment	.001394	.001502	.001194	.001257	.001432	.00
37	Gypsum, Concrete, Stone and Clay Products	.002388	.006485	.002013	.002134	.006405	.00
38	Other Non-metallic Mineral Products	.001554	.001373	.002556	.005346	.062748	.00
39	Paint and Varnish	.000839	.001256	.000990	.000892	.002325	.00
40	Industrial Chemicals, Soap and Toilet Products	.046399	.009671	.035439	.031936	.025542	.02
41	Other Chemical Industries, Petroleum and Coal Products	.056245	.006256	.041470	.033588	.016048	.02
42	Scientific and Professional Equipment	.000084	.000163	.000095	.000109	.000152	.00
43	Miscellaneous Manufacturing Industries	.001305	.002161	.001540	.001635	.002929	.00
44	Construction, Maintenance and Repair	.041140	.034041	.029311	.028641	.018361	.02
45	Transportation, Storage and Trade	.095319	.075458	.098883	.080866	.094267	.14
46	Utilities	.017479	.037412	.016416	.017911	.017731	.01
47	Communications and Other Services	.147903	.103586	.115907	.122342	.109894	.11
48	Unallocated Sector	.044087	.114505	.058500	.070319	.107407	.07
49	<b>Total</b>	1.989226	1.623762	2.497392	2.379005	2.226788	2.38

Note: Figures may not add to total due to rounding.



Biscuits and Bakeries	Other Food Industries	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton, Wool and Synthetic Textile Mills	Other Primary Textile Mills	Other Textile Industries	Knitting Mills	Clothing Industries	Industry No.
7	8	9	10	11	12	13	14	15	16	
4381	.524211	.138663	.008596	.009575	.005402	.004632	.005692	.005102	.004291	1
00895	.001107	.000859	.001095	.000677	.000426	.000409	.000980	.000409	.000654	2
3833	.015193	.001735	.001799	.007662	.000798	.000796	.001111	.000970	.000778	3
3816	.003897	.001269	.000883	.001027	.000617	.000688	.000987	.000885	.000777	4
22432	.192295	.005929	.002290	.001101	.001365	.000857	.001221	.001095	.000852	5
71773	.123789	.021184	.001848	.001679	.001152	.000929	.001201	.001053	.000873	6
00694	.000471	.000507	.000335	.000407	.000237	.000285	.000595	.000357	.000307	7
41449	1.046562	.018060	.009820	.002201	.005630	.002631	.003578	.003335	.002342	8
00655	.007254	1.124875	.000285	.000283	.000191	.000186	.000289	.000230	.000199	9
03815	.006488	.004734	1.145408	.112175	.002030	.010690	.006442	.002760	.002550	10
00114	.000111	.000156	.000158	1.040939	.000083	.000087	.000143	.000101	.000211	11
01049	.001404	.001295	.043333	.042883	1.455976	.142729	.088830	.435880	.389270	12
00957	.002825	.000874	.001399	.000983	.024969	1.040214	.037396	.057951	.025778	13
00932	.000885	.000630	.002889	.000831	.005509	.036135	1.147287	.014255	.008504	14
00005	.000007	.000006	.000122	.000134	.004053	.000860	.000267	1.028370	.001100	15
00063	.000063	.000069	.000058	.000913	.000064	.000244	.006382	.000122	1.000089	16
00790	.001890	.000838	.000430	.000681	.000802	.000328	.000429	.000456	.000418	17
00031	.000061	.000033	.000019	.000025	.000027	.000017	.000019	.000020	.000018	18
28495	.038016	.038201	.016093	.025212	.017451	.020506	.092220	.018271	.020507	19
44224	.036732	.051954	.012658	.019292	.010547	.025732	.168862	.021344	.014621	20
5617	.012390	.014447	.008074	.016102	.005679	.007143	.010696	.007764	.006670	21
5851	.024136	.021210	.034411	.012325	.010895	.008138	.016298	.009079	.008296	22
00748	.001151	.001148	.001448	.000709	.000464	.000432	.000750	.000468	.000423	23
01416	.002104	.007241	.003046	.001835	.001133	.000934	.001766	.001078	.001145	24
00900	.001264	.001134	.002659	.000979	.000601	.000625	.000835	.000646	.000559	25
00543	.001537	.000522	.000137	.000126	.000141	.000135	.000124	.000131	.000106	26
01334	.018637	.015125	.004719	.002223	.001352	.001300	.003320	.001344	.001034	27
03509	.005131	.004742	.011459	.004984	.002696	.002063	.003525	.002429	.002237	28
01172	.001237	.001791	.002670	.006882	.000812	.001229	.014791	.001063	.000916	29
08273	.010327	.011286	.034617	.011171	.005159	.005594	.008993	.006020	.005398	30
02902	.008539	.002840	.001350	.000843	.000723	.000511	.000841	.000608	.000544	31
02855	.002904	.004214	.003268	.003284	.001847	.002013	.003317	.002231	.002024	32
00527	.000721	.000510	.000378	.000370	.000240	.000357	.001101	.000301	.000312	33
00083	.000096	.000130	.000473	.000489	.013402	.001435	.003299	.004082	.003645	34
00703	.000801	.000981	.000984	.001012	.002153	.000662	.001626	.001043	.000933	35
01019	.001242	.001497	.000925	.001041	.000683	.000678	.001065	.000758	.000678	36
01743	.002640	.006323	.002117	.000977	.000875	.000885	.001941	.000866	.000726	37
08114	.013039	.069883	.002061	.001264	.000930	.000961	.002458	.001004	.000901	38
01010	.001153	.001367	.002699	.002613	.000778	.000650	.001124	.000757	.000682	39
24242	.033592	.024043	.189701	.031167	.044370	.039604	.048753	.040926	.022342	40
21515	.031451	.015157	.011457	.007100	.002679	.004019	.026081	.003129	.012614	41
00124	.000119	.000168	.000114	.000141	.000088	.000086	.000142	.000102	.000091	42
01873	.001906	.002573	.001953	.019376	.001201	.001402	.004733	.003492	.011257	43
13810	.023507	.014692	.008877	.008177	.010423	.010072	.008648	.009682	.007738	44
91052	.094299	.080791	.050507	.067508	.047276	.074274	.067189	.060245	.059246	45
08028	.015953	.015859	.017818	.009884	.018874	.012278	.013309	.014184	.010656	46
99189	.109896	.093008	.073297	.085203	.051570	.059056	.076520	.083653	.072654	47
86609	.080011	.126451	.082566	.103563	.057688	.062056	.106099	.070636	.063204	48
25162	2.503044	1.951004	1.803307	1.670027	1.822061	1.587549	1.993274	1.920686	1.771169	49

**Table III – Total Requirements Table, Niagara Region, 1967 – Continued**  
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Wood Industries	Furniture and Fixtures	Pulp and Paper Mills	Paper Products	Printing and Publishing	Iron and Steel Mills
	Industry	17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.004209	.003794	.011068	.009187	.005568	.003794
2	Mining	.000431	.000926	.002230	.002183	.000641	.003794
3	Meat and Poultry	.000553	.000673	.001308	.001503	.001121	.000673
4	Dairy Products	.000612	.000725	.000836	.001065	.001051	.000725
5	Fruit and Vegetable Products	.000510	.000612	.003081	.002400	.001321	.000612
6	Grain Mills	.000793	.000743	.002511	.002178	.001190	.000743
7	Biscuits and Bakeries	.000222	.000273	.000331	.001806	.000424	.000273
8	Other Food Industries	.001048	.001231	.014448	.009182	.004066	.001231
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.000147	.000181	.000293	.000307	.000275	.000181
10	Rubber Products	.001977	.003156	.002416	.002892	.002571	.003156
11	Leather and Leather Products	.000069	.000081	.000119	.000142	.000116	.000081
12	Cotton, Wool and Synthetic Textile Mills	.000927	.005322	.000737	.006531	.000648	.000737
13	Other Primary Textile Mills	.000166	.000276	.000368	.000828	.000171	.000276
14	Other Textile Industries	.000267	.000322	.000356	.000453	.000382	.000322
15	Knitting Mills	.000008	.000017	.000003	.000022	.000003	.000017
16	Clothing Industries	.000055	.000045	.000052	.000058	.000045	.000045
17	Wood Industries	1.023218	.093126	.000464	.000493	.000343	.004644
18	Furniture and Fixtures	.020701	1.007443	.000023	.000025	.000020	.000023
19	Pulp and Paper Mills	.054555	.014175	1.486241	.535821	.257953	.006241
20	Paper Products	.004483	.007760	.034767	1.036669	.023988	.007760
21	Printing and Publishing	.004793	.006049	.007330	.011408	1.054813	.006049
22	Iron and Steel Mills	.012327	.168783	.014724	.020156	.010750	1.129783
23	Iron Foundries	.000692	.007988	.000613	.000728	.000531	.007988
24	Other Primary Metals Industries	.001800	.010801	.001425	.002821	.001148	.001425
25	Fabricated and Structural Metal	.000702	.009569	.000761	.000865	.000724	.000761
26	Ornamental and Architectural Metal	.000112	.000303	.000185	.000194	.000141	.000303
27	Metal Stamping, Pressing and Coating	.007230	.158820	.004191	.004954	.005168	.004191
28	Wire and Wire Products	.004390	.018709	.002465	.002988	.002620	.002465
29	Hardware, Tool and Cutlery	.009832	.016265	.001178	.001466	.001090	.001178
30	Other Metal Fabricating Industries	.007400	.132066	.006685	.007820	.006992	.006685
31	Miscellaneous Machinery	.002350	.085418	.000697	.000729	.000597	.000697
32	Motor Vehicle Parts and Accessories	.001897	.007095	.002452	.002913	.002594	.002452
33	Other Transportation Equipment	.003670	.001010	.000371	.000458	.000265	.000371
34	Electrical Appliances	.000062	.000137	.000071	.000141	.000071	.000137
35	Electrical Industrial Equipment	.000755	.003093	.000586	.000697	.000623	.000586
36	Communication and Other Electrical Equipment	.000616	.001045	.000836	.000970	.000938	.000836
37	Gypsum, Concrete, Stone and Clay Products	.002406	.003347	.007532	.007845	.001949	.003347
38	Other Non-metallic Mineral Products	.022706	.006615	.013357	.009444	.003049	.006615
39	Paint and Varnish	.002282	.009114	.000920	.001050	.000882	.000920
40	Industrial Chemicals, Soap and Toilet Products	.009400	.014109	.093270	.106782	.042516	.014109
41	Other Chemical Industries, Petroleum and Coal Products	.001833	.007685	.005837	.030925	.003071	.007685
42	Scientific and Professional Equipment	.000070	.000100	.000101	.000123	.000457	.000100
43	Miscellaneous Manufacturing Industries	.007925	.003219	.001682	.004528	.001770	.003219
44	Construction, Maintenance and Repair	.007688	.008297	.012664	.013712	.010010	.008297
45	Transportation, Storage and Trade	.103939	.069104	.078499	.080686	.048521	.069104
46	Utilities	.012519	.011016	.062703	.034541	.017252	.011016
47	Communications and Other Services	.053563	.064262	.064826	.089612	.099996	.064262
48	Unallocated Sector	.049253	.061787	.074580	.088370	.084135	.074580
49	<b>Total</b>	1.447164	2.026688	2.022195	2.140672	1.704570	1.467164

Note: Figures may not add to total due to rounding.



Iron Foundries	Other Primary Metals Industries	Fabricated and Structural Metal	Ornamental and Archi- tectural Metal	Metal Stamping, Pressing and Coating	Wire and Wire Products	Hardware, Tool and Cutlery	Other Metal Fabricating Industries	Miscel- laneous Machinery	Motor Vehicle Parts and Accessories	Industry No.
23	24	25	26	27	28	29	30	31	32	
3961	.004419	.003539	.004530	.004079	.003709	.004427	.004050	.004610	.003445	1
9574	.001800	.001630	.001163	.001789	.001545	.000961	.001803	.001646	.003358	2
0702	.000865	.000744	.000951	.000794	.000722	.000975	.000853	.000872	.000614	3
0801	.000836	.000838	.001061	.000831	.000802	.001105	.000962	.000986	.000677	4
0578	.000818	.000608	.000783	.000758	.000612	.000790	.000693	.000726	.000523	5
0761	.000882	.000697	.000895	.000817	.000728	.000880	.000799	.000898	.000666	6
0285	.000304	.000307	.000399	.000308	.000301	.000418	.000358	.000367	.000245	7
0886	.002067	.000876	.001140	.001742	.001047	.001041	.000957	.001090	.000924	8
0201	.000217	.000225	.000287	.000209	.000209	.000293	.000250	.000242	.000178	9
3141	.002813	.003570	.003486	.002738	.002418	.003489	.008017	.009484	.010037	10
0092	.000102	.000105	.000135	.000099	.000098	.000137	.000113	.000105	.000084	11
0561	.001055	.000552	.000655	.000552	.000531	.000679	.000993	.001141	.011103	12
0140	.000177	.000117	.000149	.000136	.000128	.000148	.000143	.000169	.000305	13
0354	.001164	.000381	.000483	.000341	.000371	.000477	.000437	.000429	.000373	14
0003	.000004	.000003	.000005	.000009	.000003	.000006	.000004	.000005	.000032	15
0051	.000052	.000046	.000060	.000046	.000047	.000058	.000052	.000057	.000045	16
1799	.002183	.002083	.001701	.003058	.002167	.005530	.002224	.002450	.001838	17
0051	.000063	.000053	.000047	.000073	.000056	.000124	.000059	.000100	.000050	18
5463	.007966	.005731	.009243	.010857	.010931	.010779	.006345	.008420	.005937	19
2934	.005995	.003064	.007911	.007486	.013065	.008601	.004148	.006042	.004733	20
7079	.007318	.008288	.010545	.006836	.007711	.010570	.008815	.008043	.006521	21
0032	.420438	.473803	.332625	.536495	.446991	.180442	.311680	.278103	.225336	22
1745	.010287	.011614	.005134	.006582	.005684	.007600	.028902	.041252	.057310	23
5996	1.056052	.018551	.027675	.021641	.036132	.017302	.031514	.033492	.020372	24
2841	.001336	1.013722	.002604	.000823	.001354	.002060	.075661	.014485	.002014	25
0244	.000268	.000733	1.000389	.001245	.000153	.000300	.000291	.000279	.000178	26
8326	.012036	.007849	.227272	1.003298	.002289	.105198	.013629	.075157	.010636	27
0235	.005273	.022868	.091299	.030268	1.215733	.013275	.028153	.013909	.003540	28
1746	.003154	.001833	.001924	.002500	.001560	1.007357	.004184	.003427	.015574	29
6177	.012549	.189839	.026229	.008420	.015491	.025962	1.061551	.199765	.024381	30
4934	.000844	.005815	.009796	.000600	.000777	.004770	.027810	1.018363	.001039	31
7021	.048323	.007721	.005117	.003219	.004209	.004624	.027748	.031056	1.011248	32
0881	.000912	.013484	.000437	.000326	.000356	.000414	.003521	.001004	.000738	33
0125	.003937	.000144	.000185	.000146	.000196	.000149	.000198	.000198	.000231	34
2308	.001397	.002492	.001672	.003512	.000714	.035821	.011247	.007601	.001261	35
1290	.006057	.001443	.001385	.001216	.001110	.001261	.003143	.001723	.000947	36
9913	.009613	.006991	.005611	.007844	.010167	.005473	.005314	.004860	.007648	37
1141	.003252	.001212	.005071	.001539	.001281	.001457	.001405	.001929	.007592	38
1577	.001020	.002013	.004703	.015074	.000809	.004224	.002712	.005932	.001493	39
1327	.034895	.010646	.013226	.021846	.014114	.011096	.011418	.012360	.012169	40
2005	.006015	.002051	.002503	.003485	.002332	.003034	.002092	.002490	.006458	41
0112	.000107	.000131	.000147	.000098	.000106	.000151	.000199	.000195	.000092	42
1499	.001610	.001657	.003949	.009961	.001511	.006160	.001869	.002229	.001419	43
4509	.019765	.010237	.009944	.009937	.011250	.009545	.011475	.013093	.012509	44
7724	.064444	.053989	.069333	.059378	.062033	.062895	.062677	.083299	.065042	45
5433	.033851	.017689	.014822	.019973	.021410	.013316	.015510	.016383	.019999	46
4646	.068818	.065529	.084530	.072553	.062461	.091406	.081087	.088963	.051775	47
3660	.076020	.086549	.109893	.070814	.078772	.110201	.091903	.082539	.067814	48
6864	1.943372	2.064065	2.103103	1.956351	2.046196	1.776980	1.958969	2.081967	1.680505	49

**Table III – Total Requirements Table, Niagara Region, 1967 – Continued**  
(Dollars)

Industry No.	Each entry represents the output required, from the industry named at the beginning of the row for each dollar of delivery to final demand by the industry named at the head of the column.	Other Transportation Equipment	Electrical Appliances	Electrical Industrial Equipment	Communication and Other Electrical Equipment	Gypsum, Concrete, Stone and Clay Products	Other Non-metallic
	Industry	33	34	35	36	37	
1	Agriculture, Forestry and Fishing	.003861	.004878	.003202	.004880	.009101	.003861
2	Mining	.001139	.001068	.000674	.000812	.037257	.001139
3	Meat and Poultry	.000694	.000980	.000682	.001073	.001040	.000694
4	Dairy Products	.000781	.001028	.000785	.001078	.004891	.000781
5	Fruit and Vegetable Products	.000578	.000913	.000541	.000981	.001339	.000578
6	Grain Mills	.000745	.000982	.000631	.000993	.001709	.000745
7	Biscuits and Bakeries	.000287	.000411	.000299	.000411	.000411	.000287
8	Other Food Industries	.000888	.001950	.000635	.002190	.004107	.000888
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	.000191	.000269	.000196	.000256	.000297	.000191
10	Rubber Products	.012891	.004605	.002270	.018826	.003173	.012891
11	Leather and Leather Products	.000083	.000122	.000085	.000107	.000129	.000083
12	Cotton, Wool and Synthetic Textile Mills	.001209	.001706	.001181	.003265	.000784	.001209
13	Other Primary Textile Mills	.000165	.000175	.000118	.000227	.000207	.000165
14	Other Textile Industries	.000390	.000443	.000319	.001493	.000462	.000390
15	Knitting Mills	.000005	.000007	.000004	.000010	.000004	.000005
16	Clothing Industries	.000047	.000055	.000039	.000053	.000066	.000047
17	Wood Industries	.001682	.001310	.001549	.001937	.002203	.001682
18	Furniture and Fixtures	.000051	.000042	.000041	.000052	.000060	.000051
19	Pulp and Paper Mills	.004803	.017972	.005997	.009790	.081056	.004803
20	Paper Products	.003033	.026292	.006253	.010697	.018357	.003033
21	Printing and Publishing	.006296	.009176	.006622	.007531	.009885	.006296
22	Iron and Steel Mills	.233060	.247685	.139679	.045888	.028037	.233060
23	Iron Foundries	.020427	.005416	.012635	.005766	.001200	.020427
24	Other Primary Metals Industries	.020730	.020547	.012625	.037534	.002394	.020730
25	Fabricated and Structural Metal	.007762	.001499	.003486	.002197	.001281	.007762
26	Ornamental and Architectural Metal	.000185	.000142	.000113	.000148	.000199	.000185
27	Metal Stamping, Pressing and Coating	.007354	.004241	.002318	.003721	.005673	.007354
28	Wire and Wire Products	.005660	.072107	.007147	.019059	.014822	.005660
29	Hardware, Tool and Cutlery	.002478	.001499	.001552	.001345	.034738	.002478
30	Other Metal Fabricating Industries	.096263	.017878	.046540	.027316	.013606	.096263
31	Miscellaneous Machinery	.054511	.020901	.001524	.002472	.001022	.054511
32	Motor Vehicle Parts and Accessories	.023135	.004792	.006067	.005025	.004272	.023135
33	Other Transportation Equipment	1.232297	.000498	.000378	.032893	.000462	1.232297
34	Electrical Appliances	.000918	1.006067	.000107	.000248	.000092	.000918
35	Electrical Industrial Equipment	.001941	.129457	1.001972	.032593	.001964	.001941
36	Communication and Other Electrical Equipment	.003761	.005402	.000889	1.342592	.001120	.003761
37	Gypsum, Concrete, Stone and Clay Products	.004074	.005395	.002944	.005606	1.019689	.004074
38	Other Non-metallic Mineral Products	.002232	.002383	.005666	.039870	.019644	.002232
39	Paint and Varnish	.004480	.015696	.001252	.001205	.001284	.004480
40	Industrial Chemicals, Soap and Toilet Products	.010551	.023907	.006822	.036385	.021993	.010551
41	Other Chemical Industries, Petroleum and Coal Products	.002428	.004811	.001542	.004185	.003346	.002428
42	Scientific and Professional Equipment	.000452	.000848	.000166	.000124	.000138	.000452
43	Miscellaneous Manufacturing Industries	.001352	.001873	.001384	.001567	.002185	.001352
44	Construction, Maintenance and Repair	.012690	.010002	.007951	.010603	.013900	.012690
45	Transportation, Storage and Trade	.072188	.069426	.048671	.059377	.093180	.072188
46	Utilities	.014734	.014230	.012507	.011596	.019188	.014734
47	Communications and Other Services	.070075	.088162	.070658	.106185	.087990	.070075
48	Unallocated Sector	.065345	.094855	.068831	.077123	.102388	.065345
49	<b>Total</b>	2.010901	1.944104	1.557546	1.979284	1.672345	1.872345

Note: Figures may not add to total due to rounding.



Paint and Varnish	Industrial Chemicals, Soap and Toilet Products	Other Chemical Industries, Petroleum and Coal Products	Scientific and Professional Equipment	Miscellaneous Manufacturing Industries	Construction, Maintenance and Repair	Transportation, Storage and Trade	Utilities	Communications and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	
6362	.039343	.022359	.005058	.007100	.006145	.027283	.002066	.018321	.023104	1
03346	.005013	.020007	.000817	.016593	.010449	.000452	.000686	.000689	.001116	2
03506	.008056	.004194	.001142	.001520	.000665	.001219	.000517	.006238	.005968	3
01541	.001445	.001258	.001188	.001334	.000910	.001525	.000634	.007935	.006466	4
08195	.011996	.006489	.001001	.001397	.000582	.000829	.000397	.004716	.004576	5
05912	.008733	.004913	.001025	.001425	.001089	.004629	.000418	.003995	.004642	6
00561	.000530	.000508	.000454	.000528	.000285	.000436	.000241	.003091	.002450	7
00220	.060882	.031574	.001927	.003597	.001009	.000948	.000312	.002381	.004923	8
00642	.000733	.000514	.000316	.000376	.000151	.000258	.000123	.001199	.002249	9
05662	.004879	.004100	.008370	.041759	.005467	.005225	.001026	.002079	.029084	10
00280	.000535	.000314	.001020	.001006	.000069	.000111	.000039	.000178	.001205	11
00960	.001077	.001074	.003438	.006967	.001177	.002620	.000299	.002594	.003506	12
00303	.000390	.000308	.000668	.001664	.001606	.001050	.000128	.000513	.000668	13
00629	.000582	.000538	.000728	.000853	.001120	.000949	.000197	.001037	.003775	14
00006	.000007	.000006	.000445	.000778	.000007	.000009	.000001	.000009	.000024	15
00076	.000072	.000071	.000061	.000304	.000052	.000405	.000018	.000054	.000401	16
00742	.001015	.001823	.001775	.003228	.016170	.000647	.000897	.001938	.001095	17
00031	.000039	.000057	.005112	.000168	.001108	.000049	.000060	.000110	.000058	18
27937	.072087	.054569	.025101	.028141	.014869	.009598	.002047	.005465	.042627	19
21161	.049383	.060238	.010592	.025551	.008898	.008555	.001206	.003598	.023336	20
13917	.012555	.012742	.010984	.014806	.003605	.007988	.002836	.005782	.100709	21
66699	.124001	.175819	.069401	.076288	.070139	.008804	.005227	.007669	.051989	22
01450	.002101	.002724	.003591	.002635	.009718	.000838	.000648	.000791	.004534	23
04375	.008944	.007677	.031365	.035446	.021486	.001354	.001298	.001731	.006924	24
01175	.001226	.001320	.006050	.001533	.026887	.001162	.001510	.001734	.006160	25
00285	.000333	.000304	.000180	.000177	.012224	.000336	.000622	.000698	.000327	26
09142	.022094	.011381	.029192	.013227	.016330	.001793	.001088	.001788	.005520	27
05603	.004566	.004021	.009722	.014871	.013460	.002917	.001409	.002505	.029173	28
01879	.001778	.001681	.002187	.004290	.005783	.001139	.000591	.000958	.012379	29
02162	.011647	.012386	.028558	.017819	.060678	.008972	.005204	.007368	.079892	30
01240	.001412	.001257	.002729	.001645	.004052	.001638	.001547	.001401	.005368	31
04572	.004362	.004515	.005349	.006427	.004872	.004673	.001046	.001834	.030994	32
00573	.000587	.003264	.006029	.000759	.001100	.003801	.000138	.000207	.001785	33
00125	.000139	.000132	.000233	.001354	.001242	.000104	.000081	.000124	.000701	34
01156	.001013	.000952	.008239	.002360	.006983	.000696	.000522	.000719	.006855	35
01482	.001442	.001369	.230507	.002181	.008937	.001377	.000687	.001068	.009507	36
02769	.005484	.005268	.004403	.003827	.044267	.001301	.002301	.002674	.002833	37
06735	.008785	.009439	.034542	.005570	.008006	.000942	.000607	.001398	.006837	38
00478	.002718	.003445	.002454	.002697	.003512	.000804	.000424	.001201	.008689	39
51120	1.222427	.554539	.027247	.053861	.010579	.007231	.002471	.007957	.050511	40
45472	.051420	1.074680	.009349	.057734	.002745	.002620	.000530	.002122	.006983	41
00191	.000169	.000159	1.006871	.000184	.000167	.000124	.000050	.000261	.001306	42
03740	.005129	.003541	.005439	1.042452	.003675	.002120	.000670	.001874	.018114	43
13746	.017689	.019478	.010692	.011826	1.007898	.022208	.050883	.053969	.021151	44
86417	.086228	.092264	.060658	.065795	.095382	1.062175	.021155	.028759	.229330	45
22094	.053469	.038636	.011557	.014667	.007180	.010555	1.213859	.005202	.010677	46
20314	.103150	.093867	.101606	.108901	.082100	.116538	.074891	1.131582	.318933	47
42430	.125766	.117697	.114070	.137227	.036532	.077246	.027093	.053503	1.058767	48
39413	2.147432	2.469472	1.903442	1.844848	1.641364	1.418250	1.430699	1.393021	2.248219	49

**Sectoral Classification of the 1967 Niagara Region Input-Output Table –  
Industry Titles and Definitions on the Basis of the Standard Industrial Classification<sup>1</sup>**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
1	Agriculture, Forestry and Fishing	011, 013, 015, 017, 019, 021, 031, 039, 041, 045, 047
2	Mining	051, 052, 053, 054, 055, 056, 057, 058, 059, 061, 063, 065, 066, 071, 073, 077, 079, 083, 087, 092, 094, 096, 098, 099
3	Meat and Poultry	101, 103
4	Dairy Products	105, 107
5	Fruit and Vegetable Products	112
6	Grain Mills	123, 124, 125
7	Biscuits and Bakeries	128, 129
8	Other Food Industries	111, 131, 133, 135, 139
9	Soft Drinks, Wineries, Distilleries, Breweries and Tobacco Products	141, 147, 143, 145, 151, 153
10	Rubber Products	161, 163, 169
11	Leather and Leather Products	172, 174, 175, 179
12	Cotton, Wool and Synthetic Textile Mills	183, 193, 197, 201
13	Other Primary Textile Mills	211, 212, 213, 214, 215, 216, 218, 219
14	Other Textile Industries	221, 223, 229
15	Knitting Mills	231, 239
16	Clothing Industries	243, 244, 245, 246, 247, 248, 249
17	Wood Industries	251, 252, 254, 256, 258, 259
18	Furniture and Fixtures	261, 264, 266, 268
19	Pulp and Paper Mills	271
20	Paper Products	272, 273, 274
21	Printing and Publishing	286, 287, 288, 289
22	Iron and Steel Mills	291
23	Iron Foundries	294
24	Other Primary Metal Industries	292, 295, 296, 297, 298
25	Fabricated and Structural Metal	302
26	Ornamental and Architectural Metal	303
27	Metal Stamping, Pressing and Coating	304
28	Wire and Wire Products	305
29	Hardware, Tool and Cutlery	306
30	Other Metal Fabricating Industries	301, 307, 308, 309, 315
31	Miscellaneous Machinery	311, 316, 318
32	Motor Vehicle Parts and Accessories	325
33	Other Transportation Equipment	321, 323, 324, 326, 327, 328, 329
34	Electrical Appliances	331, 332
35	Electrical Industrial Equipment	336
36	Communication and Other Electrical Equipment	334, 335, 337, 338, 339
37	Gypsum, Concrete, Stone and Clay Products	345, 347, 348, 351, 352, 353
38	Other Non-metallic Mineral Products	341, 343, 354, 355, 356, 357, 359
39	Paint and Varnish	375
40	Industrial Chemicals, Soap and Toilet Products	376, 377, 378, 379

<sup>1</sup>Standard Industrial Classification based on 1960 code.



Overall Classification of the 1967 Niagara Region Input-Output Table –  
 Industry Titles and Definitions on the Basis of the Standard Industrial Classification<sup>1</sup>  
 (continued)

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
	Other Chemical Industries,	
	Petroleum and Coal Products	365, 369, 371, 372, 373, 374
	Scientific and Professional Equipment	381
	Miscellaneous Manufacturing	382, 383, 384, 385, 393, 395, 397, 398,
	Industries	399
	Construction, Maintenance and Repair	404, 406, 409, 421
	Transportation, Storage and Trade	602, 604, 606, 608, 611, 613, 614, 615, 616, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 629, 631, 642, 647, 649, 652, 654, 656, 658, 663, 665, 667, 669, 673, 676, 678, 681, 691, 692, 693, 694, 695, 696, 697, 699, 501, 502, 504, 505, 506, 507, 508, 509, 512, 515, 516, 517, 519, 524, 527
	Utilities	572, 574, 576, 579
	Communications and Other Services	543, 544, 545, 548, 801, 803, 805, 807, 809, 821, 823, 825, 827, 828, 842, 851, 853, 859, 871, 872, 873, 874, 875, 876, 877, 878, 879, 894, 896, 897, 702, 704, 731, 735, 861, 862, 864, 866, 869, 737, 831, 891, 893, 899
	Unallocated Sector	

# Selected Economic Indicators

## Leading Indicators

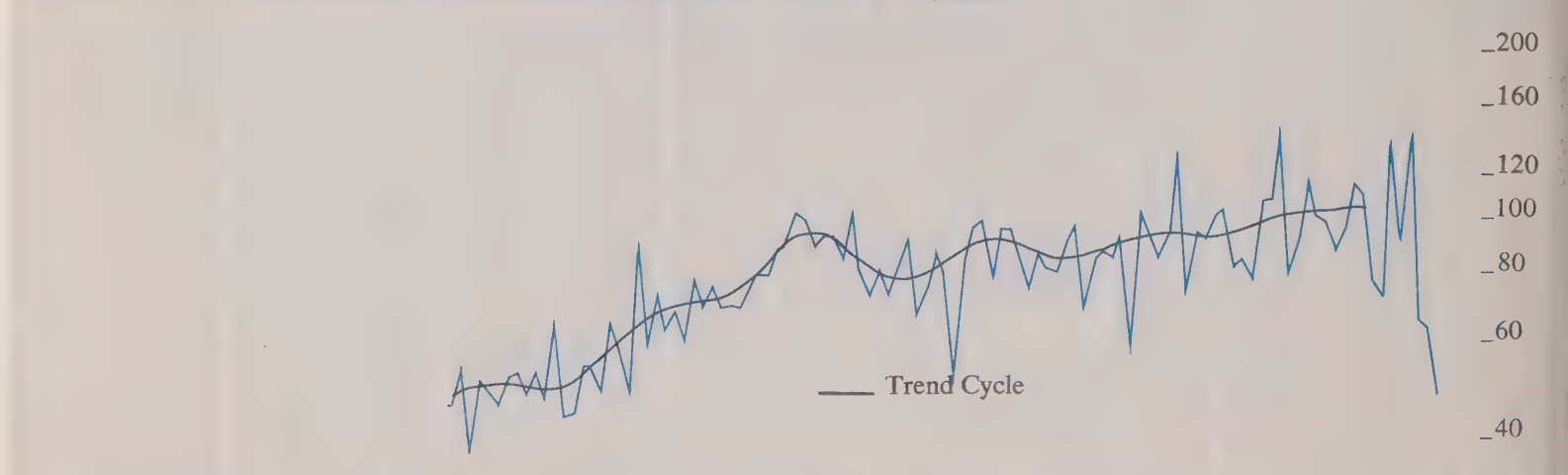
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



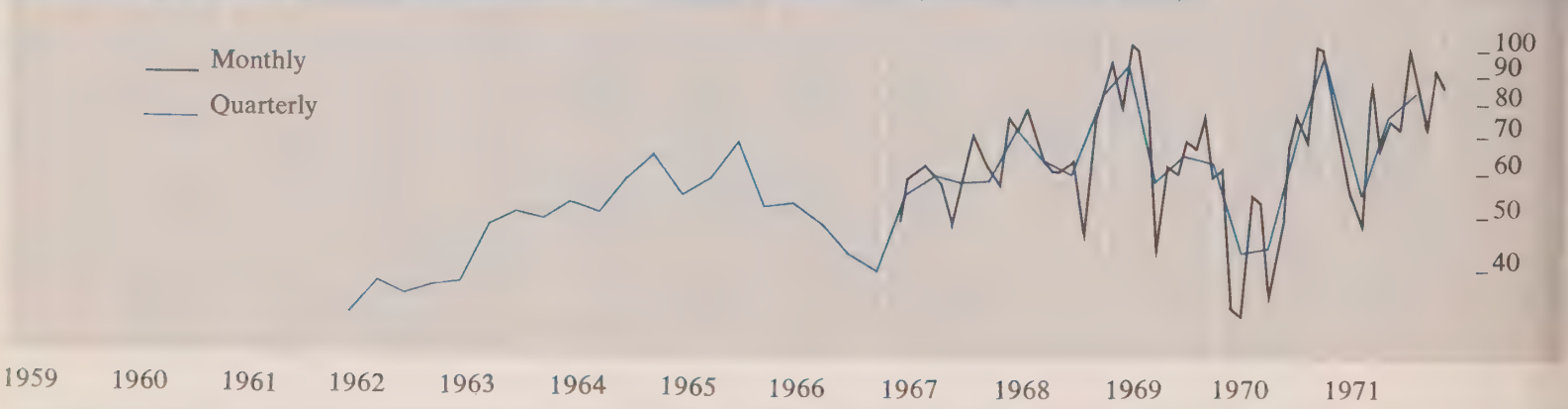
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)

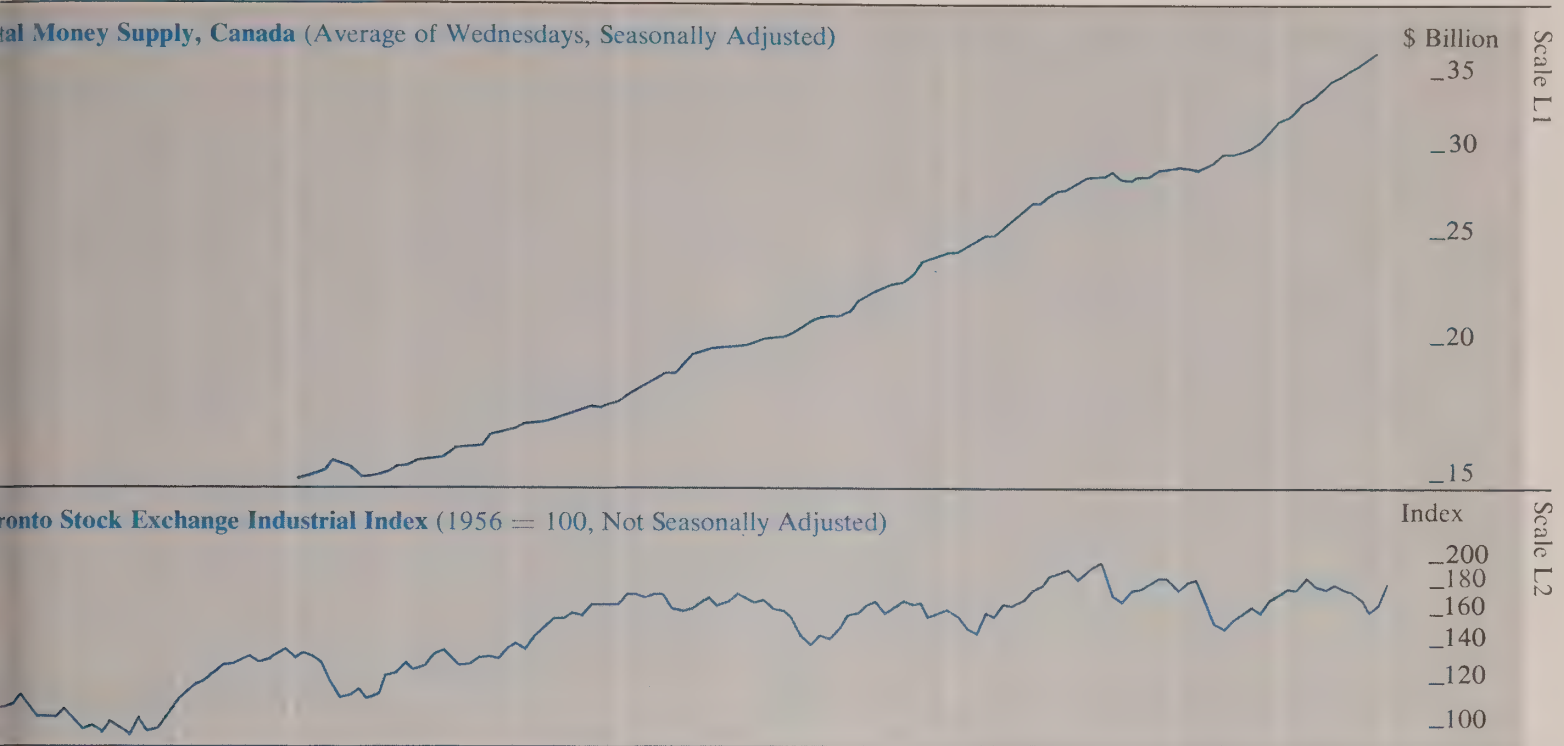


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

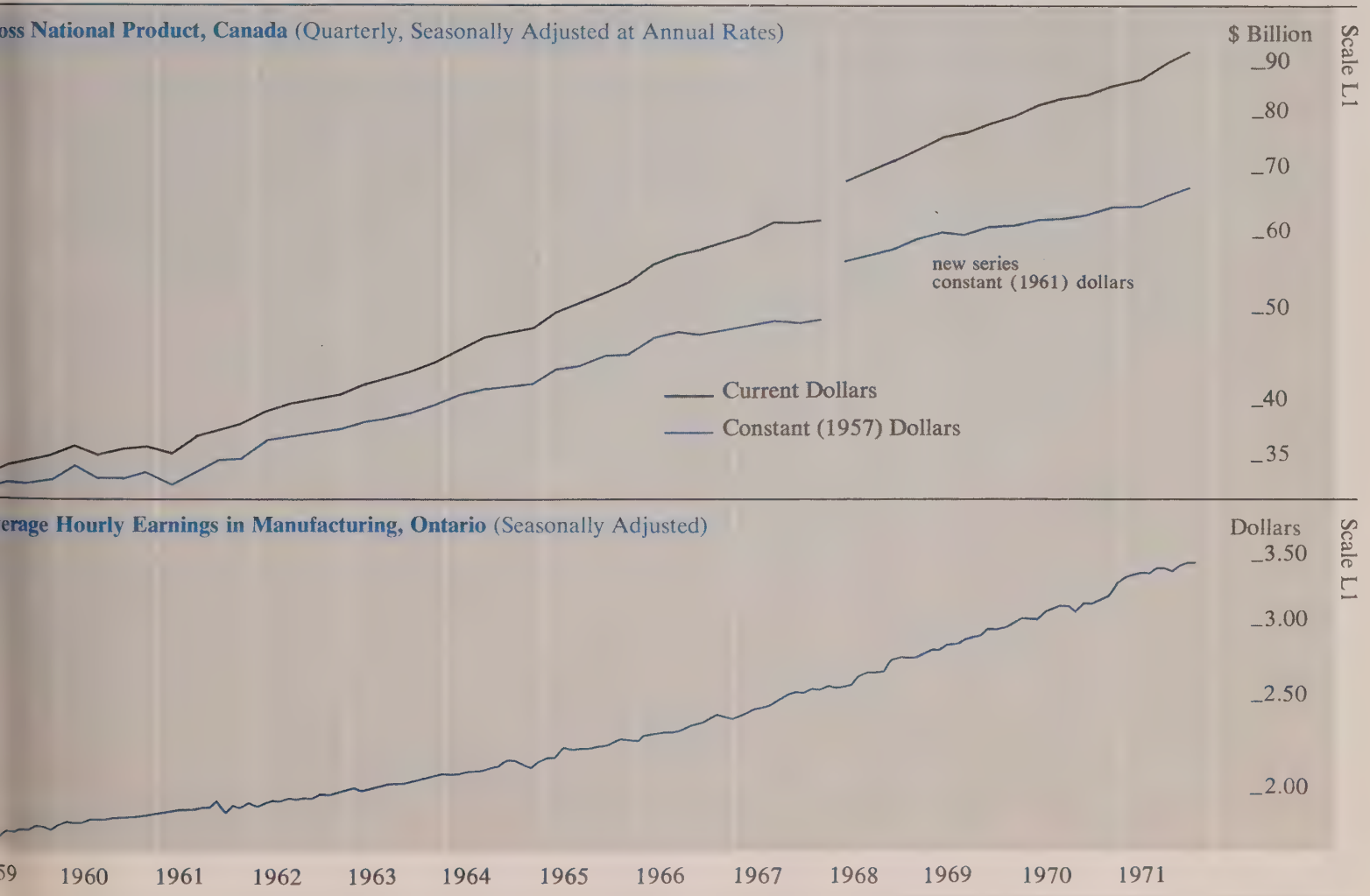




# Leading Indicators



# Coincidental and Lagging Indicators



# Coincidental and Lagging Indicators

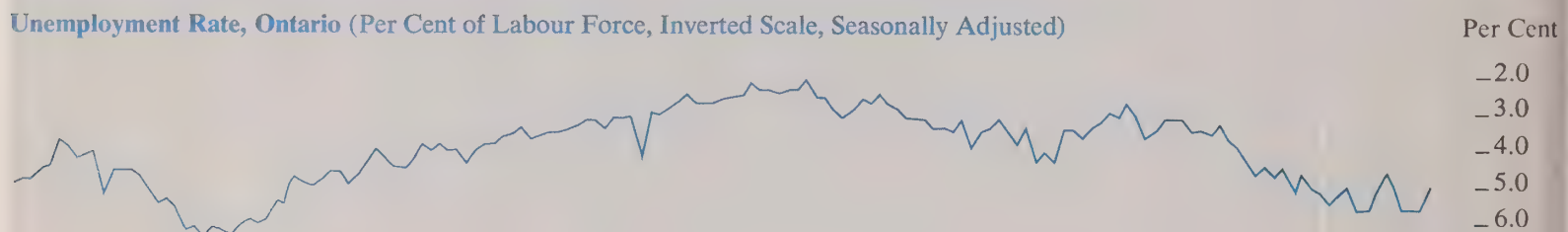
**Average Yield of 3-Month Treasury Bills, Canada** (Last Wednesday of the Month, Not Seasonally Adjusted)



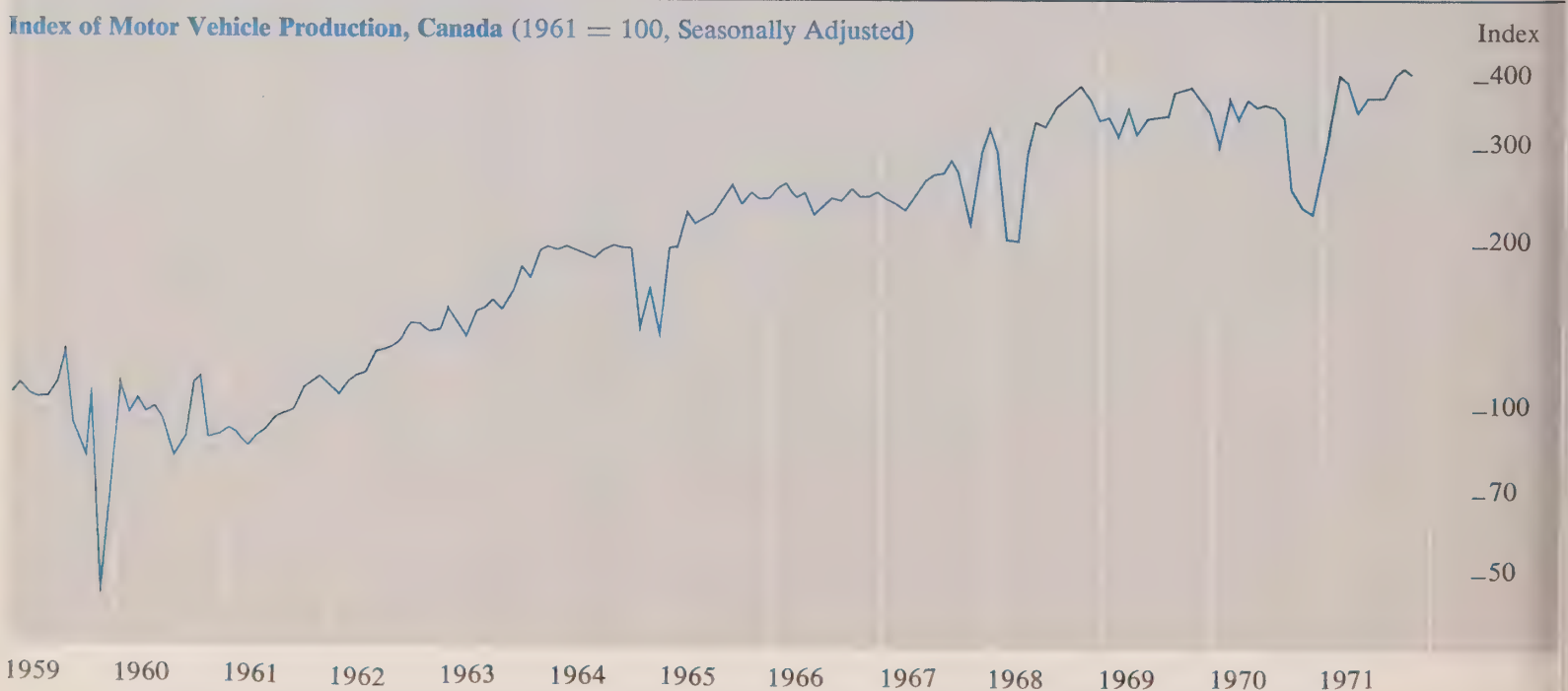
**Employment, Ontario** (Seasonally Adjusted)



**Unemployment Rate, Ontario** (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



**Index of Motor Vehicle Production, Canada** (1961 = 100, Seasonally Adjusted)





	1970		1971		Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Nov.	Dec.	Nov.	Dec.														
Leading Indicators																		
Average Weekly Hours Worked in Manufacturing	39.4	40.1	39.2	38.8	39.3	39.9	39.2	40.0	39.8	39.8	39.8	40.1	40.1	40.1	40.1	40.1	40.1	40.1
New Orders in Manufacturing Industries <sup>c</sup>	3,689	3,686	3,885	4,034	3,097	3,975	3,961	4,000	3,963	4,184	4,335	4,217	4,243	4,243	4,243	4,243	4,243	4,243
Building Permits Issued in Ontario, Non-Residential Construction	100.0	90.6	97.0	117.5	112.0	77.1	74.9	139.8	92.6	146.2	67.3	64.6	48.4	48.4	48.4	48.4	48.4	48.4
Urban Housing Starts (Annual Rate)	103,800	82,300	60,600	55,600	48,400	88,000	67,900	75,000	73,000	99,400	82,900	73,600	98,500	86,400	86,400	86,400	86,400	86,400
Money Supply <sup>c</sup>	31,197	31,696	32,135	32,511	33,144	33,495	34,292	34,896	35,016	35,393	35,950	36,320	36,926	36,926	36,926	36,926	36,926	36,926
T.S.E. Industrial Index <sup>a</sup>	168.7	174.4	178.1	177.4	185.3	181.6	177.8	180.7	177.5	176.3	169.88	160.82	166.16	181.64	181.64	181.64	181.64	181.64
Business Failures <sup>a</sup>	74	71	71	70	100	81	88	66	60	55	40	78	94	61	61	61	61	61
Business Failures — Liabilities <sup>a</sup>	5.8	7.7	11.6	4.5	5.2	3.8	3.4	5.3	8.0	5.3	2.1	5.6	5.7	3.7	3.7	3.7	3.7	3.7
Coincidental and Lagging Indicators																		
Gross National Product <sup>c</sup> (Annual Rate)		86,376			88,372			91,392							93,676			
Average Hourly Earnings in Manufacturing	3.22	3.33	3.37	3.40	3.43	3.43	3.45	3.45	3.46	3.47	3.49	3.49	3.49	3.49	3.49	3.49	3.49	3.49
3-Month Treasury Bill Rate <sup>c,u</sup>	4.40	4.44	4.68	4.06	3.16	3.00	3.03	3.37	3.68	3.79	4.06	3.47	3.24	3.37	3.37	3.37	3.37	3.37
Cheques Cashied in Clearing Centres <sup>1</sup>	6,475	6,553	6,589	7,190	7,956	7,519	7,062	7,110	7,457	7,843	7,988	8,215						
Retail Trade	903	910	900	941	947	995	992	989	983	972	1,000	1,001						
Labour Force	3,167	3,151	3,215	3,223	3,197	3,207	3,232	3,231	3,230	3,232	3,288	3,306	3,312	3,330	3,330	3,330	3,330	3,330
Employed	3,020	2,996	3,042	3,054	3,040	3,023	3,052	3,067	3,083	3,071	3,105	3,120	3,128	3,167	3,167	3,167	3,167	3,167
Unemployed	156	162	173	169	157	184	180	164	147	161	183	186	184	163	163	163	163	163
Unemployed as % of Labour Force	4.9	5.1	5.4	5.2	4.9	5.7	5.6	5.1	4.6	5.0	5.6	5.6	5.6	4.9	4.9	4.9	4.9	4.9
Wages and Salaries	1,611	1,618	1,640	1,669	1,685	1,707	1,742	1,753	1,747	1,766	1,773							
Index of Industrial Employment	129.7	132.0	131.5	132.2	131.7	131.5	132.7	132.6	132.2	132.8	132.4							
Index of Industrial Production <sup>c</sup>	171.5	170.5	171.7	172.9	172.5	171.2	174.7	175.7	176.3	179.5	180.5	181.7	181.1					
Total Manufacturing <sup>c</sup>	165.5	165.1	167.1	169.0	168.3	167.5	171.2	172.0	171.9	175.1	176.1	178.4	176.5					
Non-Durables <sup>c</sup>	155.3	152.9	152.7	150.3	150.5	150.1	154.1	155.1	154.7	156.3	156.8	158.5	158.5					
Durables <sup>c</sup>	178.4	180.6	185.3	192.7	190.9	189.4	192.8	193.5	193.7	198.9	200.5	203.5	199.4					
Mining <sup>c</sup>	186.7	180.9	177.4	176.0	176.6	174.4	179.3	180.6	184.0	184.4	185.6	183.2	186.3					
Electric Power and Gas Utilities <sup>c</sup>	194.8	201.0	203.2	201.9	202.2	198.5	197.4	198.6	202.1	208.9	210.6	208.1	212.3					
Primary Energy Demand (Annual Rate)	64.32	66.79	67.62	67.76	68.14	67.21	65.74	67.86	67.33	69.82	71.13	68.06	70.26	68.83	68.83	68.83	68.83	68.83
Exports (including re-exports) <sup>c</sup>	1,479.8	1,312.0	1,442.0	1,395.0	1,506.0	1,397.0	1,463.6	1,550.0	1,456.7	1,523.9	1,526.6	1,556.6	1,515.0	1,496.0	1,496.0	1,496.0	1,496.0	1,496.0
Imports <sup>c</sup>	1,138.0	1,020.0	1,128.0	1,181.4	1,338.8	1,181.2	1,279.9	1,344.0	1,316.9	1,387.5	1,283.9	1,464.7	1,359.0	1,337.0	1,337.0	1,337.0	1,337.0	1,337.0
Unclassified Indicators																		
Foreign Exchange Reserves <sup>c,u</sup>	3,871	3,813	3,816	3,868	3,944	3,962	3,998	3,977	4,056	4,319	4,308	4,379	4,573					
Industrial Materials Price Index <sup>c,u</sup>	266.4	264.2	264.2	266.0	266.4	267.6	267.1	267.4	266.6	267.4	267.1	266.9	268.5					
Consumer Price Index <sup>c,u</sup>	130.3	129.8	130.3	130.9	131.3	132.2	132.7	133.0	134.1	135.0	134.7	134.9	135.4	136.3	136.3	136.3	136.3	136.3
Toronto <sup>a</sup>	127.3	126.1	126.7	127.2	127.7	128.3	129.2	129.5	130.2	130.6	130.7	130.2	130.5	131.6	131.6	131.6	131.6	131.6
Ottawa <sup>a</sup>	127.6	127.2	127.5	128.3	129.0	129.7	130.5	130.9	131.8	132.0	131.7	131.6	132.3	133.0	133.0	133.0	133.0	133.0
Thunder Bay <sup>a</sup>	—	—	102.0	102.3	102.6	103.0	103.5	103.7	104.2	104.6	105.2	104.8	104.9	105.4	105.4	105.4	105.4	105.4
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>	—	—	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.73

<sup>c</sup>Statistics for Canada. <sup>u</sup>Not seasonally adjusted. <sup>1</sup>Ontario less Toronto.













# Ontario Economic Review

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Department of Treasury and Economics

Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

# Ontario Economic Review

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## The Ontario Economy

### Bold and Imaginative British Measures

by Ronald Holloway, *Economist*,  
Taxation & Fiscal Policy Branch

## Ontario's Property Tax Credit Plan

Taxation and Fiscal Policy Branch,  
Department of Treasury and Economics

A publication of the  
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Government of Ontario

**Hon. W. Darcy McKeough**  
*Treasurer of Ontario and  
Minister of Economics*

**H. Ian Macdonald**  
*Deputy Minister*

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#### About the Review

The Ontario Government is introducing a property tax credit plan that will relate the property tax burden borne by each taxpayer in Ontario to his particular ability to pay. Commencing with the 1972 taxation year, all individuals and families in Ontario will be able to deduct from their 1972 income tax liability an Ontario tax credit for property taxes paid. The Ontario tax credit will be fully refundable to taxfilers who pay no income tax and to those whose credit entitlement exceeds their personal income tax liability. Ontario's property tax credit plan is estimated to cost the provincial treasury \$160 million in the first year, or modestly more than the former basic shelter grant program. This plan will bring about a substantial redistribution of tax burdens in favour of low-income families and individuals, pensioners and farmers, at the expense of high-income taxpayers. As such, it represents the first step towards co-ordinated and comprehensive reform of the total federal-provincial-municipal tax burden bearing upon Ontario citizens.

This article, based on Budget Paper B in the 1972 Annual Budget Statement of the Hon. W. Darcy McKeough, was prepared under the direction of Dr. T. M. Russell in the Taxation and Fiscal Policy Branch, Department of Treasury and Economics.

In a short article on the 1972 British Budget, R. G. Holloway outlines recent U.K. measures to stimulate personal consumption and corporate investment.

#### Indicator Charts, Pages 13-15

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 13-15 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *This applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## TARIO BUDGET 1972

Continuing economic expansion and a substantial improvement in the unemployment situation remain the crucial issues confronting the Ontario economy. It was with this in mind that Mr. McKeough presented his budget before Parliament on March 1. He announced a fiscal program aimed at stimulating the private sector and at the same time re-ordering priorities to meet social needs. To achieve this objective the Treasurer introduced a budget containing spending controls, tax increases and a deficit of \$597 million.

The Treasurer stated that the economy required a fiscal boost combined with reasonable ease in credit conditions. He outlined his stabilization policy as aiming to maintain the province's fiscal policy on a steady course, while avoiding precipitous actions that would bring about a return to tight credit conditions.

The 1972 budget contains the tightest restraint on provincial spending in 19 years. Total provincial expenditures will increase only \$216 million or 4.5 per cent in 1972-73. Mr. McKeough stated that tough controls on Ontario's own spending were required "in order to minimize its claim on economic resources of the Province". Holding increases in direct provincial spending to \$26 million or 2.7 per cent, the provincial government was able to increase transfer payments to local governments and institutions by \$192 million. Included in the spending plan is \$75 million in new spending on school boards, municipalities and transit systems. The Treasurer noted that this will help local authorities contain property taxes in 1972.

Total provincial expenditures are forecast at \$5,051 million, compared with \$4,835 million for the past year. Mr. McKeough laid particular stress on cost control and re-ordering provincial spending priorities.

Investments in educational facilities will be cut down by \$53 million;

- Loans for public housing and the environment will be up \$29 million;
- The Province will limit the growth of the Civil Service to about 660 jobs this year — a gain of less than one per cent;
- Fees at universities and community colleges will increase by \$100 per year and new tuition fees will be established at teachers' colleges and schools of nursing;
- Many students will be helped by government loans and grants and the expanded summer program to hire 18,500 students.

Overall financial support to municipalities and school boards will amount to almost \$2 billion in 1972-73. This means that the Ontario Government will finance over 50 per cent of local government expenditures in the coming year.

The severe controls on government spending will leave room for private sector expansion in consumer spending and business investment. Mr. McKeough said he expected gross provincial product to reach nearly \$42 billion in 1972. He forecast an increase of 6.3 per cent in the volume of goods and services produced and price rises of 3.4 per cent.

About 120,000 new jobs will be created in 1972. However, with the Ontario labour force expanding at an "exceptional rate of growth" Mr. McKeough does not envisage a quick end to the problem of unemployment. The unemployment situation is expected to improve steadily and unemployment will drop to an average of 4.8 per cent of the labour force from the average of 5.2 per cent for 1971.

Although tight spending controls have been imposed, the Treasurer still has to raise \$134 million in extra revenues to keep the deficit below \$600 million. He expects to raise the additional revenue by these changes:

- A large case of beer will cost 35 cents more; draft beer will become subject to sales tax; a 25-ounce bottle of liquor will cost an average of 25 to 30 cents more; wine prices will rise an average of 15 to 20 cents per standard bottle;

- The tax on cigarettes goes up by 1.5 cents for a package of 25 cigarettes, and there is a modest increase in the tax on tobacco and cigars;
- The tax on gasoline and motor vehicle fuel is increased by one cent per gallon, and car licence plates will cost \$3 to \$5 more in 1973.

In addition:

- Some people who buy a house may pay a higher land transfer tax;
- A new gift tax is ready for tabling;
- Remuneration to vendors for the collection of taxes will be discontinued;
- Amendments will be made to the Corporations Tax Act to parallel the majority of new federal income tax provisions;
- Some changes will also be made to many departmental fees and licences, including campsite permits, tolls on the two skyways, admission to Ontario Place and the Ontario Science Centre, marriage licences and GO Transit fares.

The Treasurer also announced the introduction of property tax credits to replace the basic shelter grants. The property tax credit will be calculated and claimed when taxpayers file their annual personal income tax forms. Thus, relief against 1972 property taxes will be delivered in the form of income tax refunds in the spring of 1973.

Mr. McKeough heralded the agreement by Ottawa to administer Ontario's tax credit plan as the first real step towards co-ordinated and comprehensive tax reform. He said that Ontario intends to extend its tax credit approach to other taxes as well.

The main objective of the budget, Mr. McKeough asserts, is the expansion of private sector activity and the curbing of inflationary forces as the economy moves back to full performance.

"This expansionary and progressive overall program", the Treasurer said, "stays within the limits of moderation and will help to bring about renewed prosperity and a better life for all Ontario citizens".



# Bold and Imaginative British Measures

by Ronald Holloway, *Economist*,  
Taxation & Fiscal Policy Branch

The British Government has introduced bold and imaginative measures to stimulate both personal consumption and corporate investment at a time when high unemployment is combined with a strong external position, principally by introducing tax cuts which will total £1.2 million in the current financial year. These tax cuts entail a doubling of the projected public sector deficit.

Most of the tax reduction takes the form of the largest-ever increases in personal allowances, with cuts in purchase tax being the most significant of the other changes in terms of immediate revenue loss. The introduction of free depreciation on plant and machinery and increased allowances for industrial buildings will have little effect on revenue for the current year but will represent a major cut in company taxation in future years, estimated at £450 million in 1975-76. Other measures designed to nearly double the rate of economic growth include a new drive for industrial expansion and regional development which could soon rise to an annual cost of up to £1 billion a year. This will include new regional development grants, estimated at £300 million in 1975-76, grants to workers willing to move homes to find satisfactory jobs, tapering shipbuilding grants, accelerated machine tool orders, and new road programs to improve communications between important industrial areas and to provide better access to the ports.

The Chancellor announced last year his intention of reforming corporation tax to remove the discrimination against distributed profits, explaining that this distorts the capital market by impeding companies needing to raise equity capital and so misallocating investment resources as well as lessening the pressure for efficiency. Following the appointment of a select committee, the Chancellor has abandoned his earlier preference for a two-rate system and he has announced his intention of introducing legislation to convert corporation tax to the imputation system. As with the French and Canadian systems, this will provide shareholders with credits for part of the tax paid by a corporation. For most companies trading overseas, relief for overseas tax under the new system will be more favourable than at present and none will be worse off.

A lower rate of tax is to be charged on small companies, defined as those with annual profits of not more than £15,000. On the basis of an illustrative rate of cor-

poration tax of 50 per cent in future years, the rate for small companies will be 40 per cent. Tapering relief will be provided for companies with profits up to £25,000. Many small companies will also benefit from a revision of the close company regulations, particularly from an easing of the distribution shortfall provisions. Further, a fraction of their capital gains will be excluded from charge and the remainder charged to corporation tax at the full rate. The capital gains tax will also be eased for stock options and for trusts.

Company profits will also benefit from increased sales resulting from the lowering of the top rates of purchase tax, charged on the wholesale value of goods. The 45 per cent rate (which applied to luxury items such as jewellery and furs) and the 30 per cent rate (which applied to cars, consumer durables and such items as watches and toys) have both been cut to 25. As a result, it is expected that there will be a reduction of about two-thirds of a point in the cost of living.

This change in rates is partly due to the erosion of the traditional distinction between essential goods and luxuries but it also paves the way towards the adoption of a value-added tax next year, replacing both purchase tax and the selective employment tax. The VAT will have a single rate of 10 per cent, making it the lowest and simplest in the world. As in all other countries with a VAT, there will be exemption for a variety of financial, personal and charitable services. While such exemption will mean that a supplier does not have to charge tax on sales, it also means that tax cannot be reclaimed by the supplier on purchases. This contrasts with the treatment under zero-rating which will be applied to most food items and to housing, domestic fuel and light, fares, books, periodicals and newspapers, and exports. In broad terms, a company which supplies zero-rated goods or services will get complete relief from VAT on both its purchases and its sales. Despite this relief to suppliers, the tax is described as a tax on consumers.

In the field of personal taxation, there are both immediate reliefs and promised reform. Apart from the major increase in allowances, the income limits for age exemption and small income relief have been raised, the starting point for surtax has been raised, and tax relief on interest payments extended from mortgage interest to all forms of interest

payments above £35 (this limit being introduced to provide equity between taxpayers able to secure loans and those with low credit ratings who have to fall back on loan purchase agreements).

With surtax already being announced due for phasing out, new rates of income tax have been announced as operative next year. These provide a basic rate of 30 per cent on the first £5,000. This will be the only rate of tax on most personal incomes. For the next £1,000 the tax rate will be 40 per cent and for incomes above £6,000 the rates will increase in 5 per cent steps to a maximum of 75 per cent on £20,000. There will, however, be a 15 per cent surcharge on investment incomes above £2,000.

Relief has also been applied to death taxes with generous exemptions from estate duty on property left to spouses and charities, and an increase in the threshold below which estate duty is payable. A new scale also reduces the burden of estate taxation, a rate of 75 per cent being reached on property over £500,000.

More radical reforms of personal taxation are under consideration, with a view to simplifying collection and permitting integration with the social security system. The proposals are for a conversion of the pay-as-you-earn system from a cumulative basis to a non-cumulative, saving 10,000 to 15,000 civil servants, and for the introduction of tax credits in lieu of a complex system of social security payments and rebates. The Chancellor has stated that such a system would provide a fairer and more accurate method of directing help to many people in need and it would tidy up the present borderline between taxation and social benefits. He added that it would provide a smoother graduation from the area of benefit to the area of taxation, and so would avoid some of the worst features of what has become known as the poverty surtax, with all that that implies in the way of disincentives to earn more.

While the adoption of such a scheme is still to await elaboration in a promised Green Paper, and, probably, referral to a select committee, the Government has announced increases in retirement pensions and other social security benefits in the autumn. These increases will amount to about 12.5 per cent and, when taken with the increases made last autumn, will mean an improvement of about a third. On constant price terms, public spending will increase by 6.5 per cent.



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## INTRODUCTION

Over the past three years, the Government of Ontario has worked towards the goal of incorporating property taxes within the personal income tax system through the mechanism of tax credits. The Ontario government first declared its intention to connect and co-ordinate income taxes and property taxes via a credit scheme in its 1969 white paper on provincial-municipal reform.<sup>1</sup> The public shelter grants were initiated in 1968 on the recommendation of the Smith Committee as an interim step in this direction. However, the fairest and most effective method of relieving property tax burdens is to relate them to the ability-to-pay principle which governs personal income taxation. Such an integrated system of personal income and property taxes permits systematic redistribution of both burdens and achieves comprehensive relief for all taxpayers, including those too poor to pay income tax.

Throughout the long debate on national tax reform, the tax credit approach was consistently advocated by the Ontario government as a superior alternative to a system of increased personal exemptions in the delivery of tax relief.<sup>2</sup> In its extensive studies and recommendations on reform of the national income tax structure, Ontario demonstrated the conceptual and operational superiority of tax credits over increased personal exemptions in terms of equity to taxpayers, lower administrative cost, simplicity and greater flexibility in response to changing needs over time.<sup>3</sup>

While rejecting the use of selective income tax credits as a means of achieving tax relief for low-income taxpayers on a national basis, the federal government nevertheless agreed in principle to consider implementing provincial tax credits along the lines favoured in Ontario. Specifically, in discussing the Ontario government's white paper on provincial-municipal tax reform, the federal Minister of Finance noted:

The third purpose of the Ontario proposal is described as making it possible to permit deductions from the provincial income tax by way of credits for property taxes, retail sales taxes and health insurance premiums. Such credits, it is said, might vary with incomes and family circumstances, and might even involve net payments to those whose credits exceed their provincial income tax liability. The introduction of such tax credits would greatly

complicate the tax return and collection administration. Nevertheless the government would be prepared to discuss the possibility of carrying out such operations under revised collection agreements.<sup>4</sup>

Immediately following the introduction of the new federal income tax legislation (Bill C-259) in June 1971, the Ontario government proceeded to design a simple tax credit system for the benefit of Ontario taxpayers. The system which has been developed is sufficiently flexible to be adapted easily to other provincial taxes, and should prove to be a useful model for other provinces interested in similar reforms.

The major dimensions of Ontario's tax credit plan were outlined to the federal government in November 1971. The Province also requested that it be incorporated in the Canada-Ontario tax collection agreement.<sup>5</sup> The administrative and operational details of this Ontario tax credit plan were then discussed extensively by Ontario and federal officials and a number of modifications were worked out.<sup>6</sup> Upon finalization of these details in February 1972, the government of Canada agreed to administer Ontario's property tax credit plan and indicated that it would be used as the standard for other provinces. Commencing with the 1972 taxation year, therefore, this tax credit plan will come into effect and Ontario taxpayers will be able to deduct from their 1972 income tax liability an Ontario tax credit for property taxes paid.

The balance of this paper sets out the full details of the Ontario property tax credit plan, its objectives, design, superiority over present provincial tax relief programs and its impact on representative groups of Ontario taxpayers.

## II THE ONTARIO PROPERTY TAX CREDIT

Four aspects of the property tax credit plan will be of prime interest to Ontario taxpayers — its objectives, the amount of the credit, who is eligible to receive it, and how it is to be claimed. The following sections discuss in detail these four aspects of the property tax credit to be legislated by Ontario in 1972.

### Objectives

The overriding objective of Ontario's property tax credit plan is to achieve a fairer distribution of the burden of property taxes on individuals and families in Ontario.

Analysis of the incidence of property taxation in Ontario has confirmed that it is regressive over much of the income scale and extremely so for the lowest income groups.<sup>7</sup> It should be emphasized that this situation is not peculiar to Ontario. President Nixon stated in January of this year that property taxation was "one of the most oppressive and discriminatory of all taxes, hitting most cruelly at the elderly and the retired". Subsequently, he instructed the Advisory Commission on Intergovernmental Relations to review proposals for federal action.<sup>8</sup>

The Ontario basic shelter grants have partially offset this regressivity by providing a flat amount of relief to all taxpayers on the basis of average municipal taxation. However, this program was not adequate either in terms of vertical or horizontal equity. It did not provide sufficient relief to the lowest

<sup>1</sup>See Hon. Charles MacNaughton, "Reform of Taxation and Government Structure in Ontario", Ontario Budget 1969 (Toronto: Department of Treasury and Economics, 1969).

<sup>2</sup>See Hon. W. Darcy McKeough, Ontario Budget 1971 (Toronto: Department of Treasury and Economics, 1971), p. 7.

<sup>3</sup>See Hon. Charles MacNaughton, Ontario Proposals for Tax Reform in Canada (Toronto: Department of Treasury and Economics, 1970), pp. 15-17; and Staff Paper, Effects of Ontario's Personal Income Tax Proposals, Ontario Studies in Tax Reform 2 (Toronto: Department of Treasury and Economics, 1970), Chapter 4.

<sup>4</sup>Hon. E. J. Benson, Proposals for Tax Reform (Ottawa: Queen's Printer, 1969), p. 83.

<sup>5</sup>See Hon. W. Darcy McKeough, "Preliminary Outline of a System of Property and Sales Tax Credits for Ontario Taxpayers", Meeting of Ministers of Finance, Ottawa, November 1-2, 1971 (Toronto: Department of Treasury and Economics, mimeo.).

<sup>6</sup>Altogether five meetings of officials from the Ontario Department of Treasury and Economics and the Department of National Revenue were held between November 1971 and February 1972 and extensive correspondence was exchanged. A major modification to the original Ontario design was the deletion of the sales tax credit in order to keep the Ontario plan as simple as possible in the first year.

<sup>7</sup>A detailed quantitative study of the incidence of the property tax in a representative Ontario city has been undertaken by the Taxation and Fiscal Policy Branch of the Ontario Treasury. The results of this analysis are summarized in Appendix A. See also the forthcoming Staff Paper, Analysis of Income and Property Taxes in Guelph (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs).

<sup>8</sup>See President Richard M. Nixon, State of the Union Address (Washington: United States Information Service, January 20, 1972), p. 6.



income groups, nor did it provide equal treatment to taxpayers in similar economic circumstances.<sup>9</sup> The clear thrust of permanent reform, therefore, must be to link property tax burdens directly to the ability to pay of each individual and family in Ontario.

The Ontario government's property tax credit plan aims to achieve this important goal of a more consistent and progressive incidence of property taxation in Ontario. Specifically, it has been designed to meet five objectives:

- To relate the combined burden of income tax and property tax bearing on Ontario residents to their individual ability to pay;
- To reduce the total tax burden on the lowest income families and individuals in Ontario;
- To extend property tax relief to roomers, boarders and others who do not presently benefit from provincial tax relief grants and to eliminate tax relief to non-residents and to taxpayers who can afford to pay;
- To permit better control over the total provincial-municipal tax burden on Ontario taxpayers; and
- To establish a flexible and efficient pay-out mechanism as the first step towards the eventual replacement of welfare and subsidy programs with a general income support program.

One further objective of Ontario's plan has been to design a tax credit which is simple for taxpayers to understand and calculate on the income tax form, and efficient for government to administer. This dimension of simplicity is important to ensure maximum participation by Ontario taxpayers and the greatest possible improvement in overall equity. The property tax credit system to be introduced in 1972 meets these requirements, yet it is sufficiently flexible in structure to allow significant modification and enrichment in subsequent years.

#### Amount of the Property Tax Credit

The amount of property tax credit available to any taxpayer will depend on his ability to pay. Ontario's tax credit system will generate credits which vary according to income, family size and the level of property taxes paid. Thus, each taxpayer will be entitled to a property tax credit which is tailored to his particular economic circumstances.

The specific formula for determining the 1972 property tax credit will be as follows:

#### Homeowners

- \$90 plus 10 per cent of property tax paid minus 1 per cent of taxable income, up to a maximum credit of \$250;

#### Renters

- \$90 plus 2 per cent of annual rent minus 1 per cent of taxable income, up to a maximum credit of \$250.

Where the property tax paid is less than \$90, or the annual rent is less than \$450, the tax credit entitlement will be equal to the actual property tax paid or 20 per cent of rent paid, minus 1 per cent of taxable income. This is to ensure that a taxpayer who is resident in Ontario for only a few months in the year or who pays a very low property tax or rent is not unduly bonused.

This design of credit ensures a maximum benefit to low-income families and individuals and a smoothly progressive incidence up the income scale. It means that families who are too poor to pay income tax will receive a refund of at least \$100 and in most instances significantly more. It means that middle-income taxpayers will receive tax relief which is roughly equal to the basic shelter grant which they formerly enjoyed. Thus, a family of four having an income of \$10,000 and paying \$400 in property tax would be entitled to a tax credit of \$73, as would a single person earning \$7,600 and paying \$150 a month in rent. It also means that high-income families and individuals will receive no benefit from the property tax credit.

Additionally, this tax credit design ensures that all taxpayers in similar economic circumstances will receive equal treatment. At any particular income level, all families of the same size and paying the same property tax will receive an identical property tax credit. As family size increases, or the level of property tax rises, the value of the tax credit also will increase. In this way, the tax credit mechanism provides a marked improvement in terms of horizontal equity, and redistributes the combined property and income tax burden on a much fairer basis.

#### Eligibility

In general, all taxpayers who are resident in Ontario on December 31 and who file a personal income tax return will be eligible to claim the Ontario property tax credit. Non-residents who formerly received basic shelter grants will no longer benefit, therefore, from Ontario's tax relief provisions.

Eligible residents will include those who have died during the year and on whose behalf a 'year of death' return is filed. (The three categories of residents will be included from claiming a credit under the plan:

- children under 16 years as of December 31;
- persons under 21 years as of December 31 who live at home and are claimed as dependants for income tax purposes;
- residents of homes for the aged, charitable homes, nursing homes and similar institutions which are exempt from property taxation.

The Ontario property tax credit plan will embrace roomers and boarders as well as families and individuals who rent and home owners. The credit will apply, however, only to the principal residence of the taxpayer, not to cottages and second homes. In other words, the credit entitlement will be confined to the place of permanent residence of each family or individual. For families who move, of course, all places of permanent residency in Ontario during the year may be included in determining the total property tax or rent paid and the amount of tax credit entitlement. The tax credit plan will achieve a broader coverage than the former basic shelter grants in that roomers and boarders will qualify for tax relief, but at the same time it will be more selective in impact by confining relief to the principal residence only.<sup>10</sup> These changes alone will render Ontario's tax relief efforts far more equitable.

Within this framework of broad eligibility, the tax credit legislation will include a number of definitions and rules to prevent abuse and ensure efficient administration. The most important of these is the rule that in cases where spouses reside in the same principal residence, the property tax credit may be claimed by the spouse having the higher taxable income. This will avoid the possibility of a substantial tax credit being paid to a family in which one spouse has a high income while the other spouse has a low income. A limited number of other special rules will also apply, including the following:

- Public housing tenants and senior citizens tenants will qualify for the tax credit on the basis of the actual rent they pay;
- The amount of property tax that may be claimed as paid by post-secondary students living in college residences will

<sup>9</sup>This deficiency in horizontal equity is evident from the fact that the shelter grant paid to any particular taxpayer in 1971 ranged from extremes of \$33 to \$101 depending upon the municipality in which he lived.

<sup>10</sup>Under the former basic shelter grant program, tax relief was provided only to separately assessed housing units, which ruled out many roomers and boarders.



limited to \$25, the equivalent of provincial grants-in-lieu of taxes;

Rent will be defined broadly to include the payment for accommodation including heat, light and parking, but excluding any payment for meals or board.

### Timing the Tax Credit

Ontario property tax credit will be calculated and claimed when taxpayers file their annual personal income tax return. The 1972 property tax credit will be claimed in the 1972 income tax return and tax relief will be delivered in the form of an income tax refund in the spring of 1973.<sup>11</sup> In co-operation with the Department of National Revenue, the Ontario government will make a special effort to assist those persons who have never filed an income tax return in order to ensure that they get the benefits to which they are entitled.

The 1972 income tax return to be filed by Ontario taxpayers will include a special section for claiming Ontario's property tax credit. While final details have not yet been worked out with the Department of National Revenue, this separate tax credit form will require only two things of taxpayers:

1. A signed declaration of the amount of property tax and/or rent that has been paid in the year; and

2. A calculation of the amount of tax credit to which the taxpayer is entitled.

Additionally, taxpayers must be prepared to substantiate their declaration of the amount of property tax or rent paid, upon request by the Department of National Revenue. In these instances the taxpayer will be required to produce a receipt showing that he has indeed paid the amount of property tax or rent that he has claimed for purposes of the tax credit. The Province is developing a standard receipt form which will be provided to all households at the end of the year or upon moving, in much the same way that T-4 slips are now provided by employers. In working towards this, the Ontario government invites the full participation and co-operation both of municipalities and landlords.

It is recognized that problems in the operation of Ontario's tax credit plan will inevitably emerge in the first year. However, the simplicity of the tax credit design and its advantages to Ontario taxpayers, the difficulties should quickly work them-

selves out. In subsequent years the Ontario property tax credit will become a standard part of the taxpayer's annual tax calculation and an institutionalized element in the income tax collection and refund system. Thus tax reform in Ontario will reach beyond the personal income tax to achieve a fairer distribution of property tax burdens and equal treatment of taxpayers in similar economic circumstances.<sup>12</sup>

### III IMPACT OF THE PROPERTY TAX CREDIT ON ONTARIO TAXPAYERS

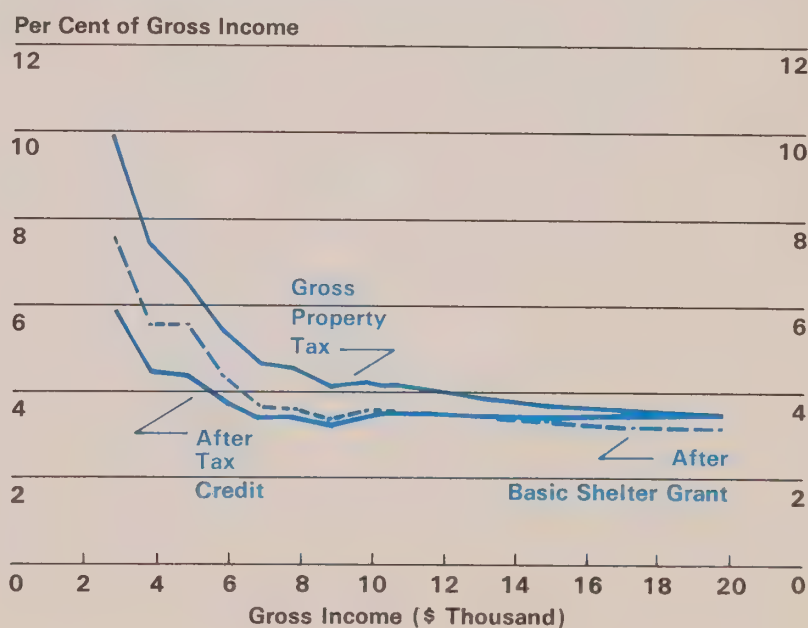
The Ontario government's tax credit will achieve a substantial redistribution of 1972 property tax burdens. It will provide refunds of \$100 or more to all families and individuals who are too poor to pay income tax and it will provide tax relief to roomers and boarders. It will reduce taxes for individuals and families in the lowest brackets of taxable income and for old age pensioners and farmers. The tax burden on middle-income taxpayers will not change appreciably and the tax burden on high-income taxpayers will increase by about \$70, the amount of the former average basic shelter grant. Taxes will also increase for taxpayers who formerly

enjoyed more than one basic shelter grant — such as for a cottage or a second home — whatever their income levels.

The following tables illustrate how the Ontario property tax credit will affect representative taxpaying units at different levels of income and property tax liability. It can be seen that the property tax credit is of maximum value at the bottom end of the income scale and tapers off gradually to zero when income exceeds \$20,000 - \$25,000. The breakeven point at which a typical taxpayer will be no better or no worse off than at present is about \$7,800 for single persons, \$9,400 for couples and \$10,800 for a family with two children.

The progressive impact of the property tax credit is clearly portrayed in Chart 1. This graph shows the value of the tax credit at each income level as a proportion of the gross property tax burden on a representative family. Thus, the tax credit relieves 40 per cent of the gross property tax burden on a family having \$3,000 income versus 20 per cent at \$9,000 income and none of the burden at \$25,000 income. Quite clearly then, linking property taxes to ability to pay produces a fairer and more progressive incidence of the combined burden of property and income taxation in Ontario.

Chart 1—Incidence of Property Taxation on a Representative Family of Four



Source: See Table 1.

the 15 per cent of taxpayers whose  
actions-at-source or quarterly instalments  
less than their final income tax liability for

the year, the property tax credit will take the  
form of a deduction against the income  
tax owing.

<sup>12</sup>Parallel suggestions for such a remedy have  
been made in the United States. See J. Pechman,  
Fiscal Federalism for the 1970's (Washington:  
The Brookings Institution, 1971).

**Table 1 — Impact of Ontario Property Tax Credit (Family With 2 Children Under 16)**  
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
3,000	300	70	120	+50
4,000	300	70	119	+49
5,000	330	70	113	+43
6,000	330	70	104	+34
7,000	330	70	94	+24
8,000	360	70	88	+18
9,000	370	70	79	+ 9
10,000	420	70	75	+ 5
12,000	480	70	62	— 8
15,000	555	70	42	—28
20,000	680	70	7	—63
25,000	730	70	0	—70

**Table 2 — Impact of Ontario Property Tax Credit (Married Couple)**  
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
3,000	300	70	120	+50
4,000	300	70	113	+43
5,000	330	70	107	+37
6,000	330	70	98	+28
7,000	330	70	88	+18
8,000	360	70	82	+12
9,000	370	70	73	+ 3
10,000	420	70	69	— 1
12,000	480	70	56	—14
15,000	555	70	36	—34
20,000	680	70	0	—70
25,000	730	70	0	—70

Notes: 1. The pattern of estimated gross property tax is based schematically on the observed distribution in Guelph as projected to 1972. See Appendix.

2. Taxable income used in calculating the property tax credit is based on the new levels of personal exemptions, \$100 standard deduction, 3 per cent employment expense deduction and a pension contribution equal to 6 per cent of gross income.

3. The formula for determining basic shelter relief was \$30 plus 10 per cent of the average municipal tax burden of the previous year.

#### IV COMBINED IMPACT OF THE TAX CREDIT AND SUPPLEMENTARY TAX RELIEF PROGRAMS

The Ontario property tax credit plan will replace the basic shelter grant program which has been in force since 1968. The general relief against 1972 property taxes will be delivered in the form of income tax refunds in early 1973 rather than as property tax reductions or rebates in the fall of 1972. In addition, the two other provincial tax relief programs — the 25 per cent fall tax rebates and the \$50 to \$100 supplementary tax relief grants to needy pensioners — will continue intact for 1972.<sup>13</sup>

##### Needy Pensioners

The new property tax credit plan will provide larger benefits to G.I.S. pensioners than the basic shelter grant program which it replaces. Under the former shelter grant program, needy pensioners who lived in a separately assessed housing unit received about \$70 in tax relief. Under the property tax credit plan, all G.I.S. pensioners who qualify for general property tax relief — including those that are roomers and boarders — and this tax credit relief will amount to at least \$100 because pensioners who qualify for the guaranteed income supplement have no taxable income.

In addition to the property tax credit, G.I.S. pensioners will continue to benefit from Ontario's \$50 to \$100 supplementary tax relief grants. Thus, an eligible pensioner or pensioner couple paying \$210 in property tax will enjoy a complete refund through the combined benefits of the tax credit and supplementary grants. Virtually all needy pensioners in Ontario, therefore, will be sheltered entirely from the regressive burden of property taxation. Table 5 displays the increase in relief to needy pensioners resulting from the combined tax relief programs.

##### Farmers

The Ontario property tax credit plan will generate larger benefits to farmers than the former basic shelter grant program. For the many Ontario farmers who have no net income tax liability, the tax credit formula will provide general tax relief in excess of \$100, or at least \$30 more than the basic shelter grant. Most farmers who are liable for income taxation will also enjoy larger benefits since their taxable income is generally very low. On top of this general

<sup>13</sup>Pensioners who qualify for the federal guaranteed income supplement receive from the Ontario Government a supplementary tax relief grant of \$50, plus up to \$50 depending upon the amount of property taxes paid.



of farmers will continue to enjoy the special 25 per cent farm tax rebate. Thus, most all farmers in Ontario will benefit in terms of total tax relief as a result of the property tax credit plan. Table 6 illustrates the increase in benefits available to farmers in 1972 and shows that the property tax burden will be removed almost entirely from the poorest farmers.

While the special tax relief programs for pensioners and farmers will be continued in 1972, the Province would prefer to incorporate this supplementary tax relief within the general tax credit system in subsequent years.<sup>14</sup> Apart from the merits of simplicity and efficiency, such a rationalization would permit fairer treatment among all pensioners by eliminating the sharp cut-off between those who qualify for the guaranteed income supplement and those who do not. The tax credit formula is sufficiently flexible to allow extra benefits to particular classes of taxpayers, and this is one of its great advantages. After the tax credit system has been in operation for a year and its impact has been fully analyzed, Ontario hopes to be in a position to enrich and modify the basic tax credit formula as a replacement for these existing programs.

## FUTURE DIRECTIONS

The introduction of tax credits, fully integrated within the personal income tax collection and refund system, will advance substantially the Ontario government's thrust towards comprehensive tax reform. The introduction of Ontario's property tax credit in the 1972 income tax form will, for the first time, directly link property tax and income tax burdens, relating both to the ability-to-pay principle. This demonstrates that the same tax mechanism can be used as the vehicle for achieving a systematic and more progressive distribution of total tax burdens, including income tax burdens. The Government of Ontario intends to extend its tax credit approach, therefore, to offset the relative impact of other taxes as well. In this way, the Province will be able to achieve a coordinated and comprehensive reform of all taxes bearing upon Ontario citizens. Since the property tax credit system is being introduced smoothly, Ontario will consider the implementation of a retail sales tax in the near future. The Province has already explored a number of alternatives towards this end and has outlined one possible retail sales tax

**Table 3 — Impact of Ontario Property Tax Credit (Single Person)**  
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
3,000	300	70	109	+39
4,000	300	70	100	+30
5,000	330	70	94	+24
6,000	330	70	84	+14
7,000	330	70	75	+ 5
8,000	360	70	68	- 2
9,000	370	70	60	-10
10,000	420	70	56	-14
12,000	480	70	43	-27
15,000	555	70	22	-48
20,000	680	70	0	-70
25,000	730	70	0	-70

- Notes: 1. The pattern of estimated gross property tax is based schematically on the observed distribution in Guelph as projected to 1972. See Appendix.
2. Taxable income used in calculating the property tax credit is based on the new levels of personal exemptions, \$100 standard deduction, 3 per cent employment expense deduction and a pension contribution equal to 6 per cent of gross income.
3. The formula for determining basic shelter relief was \$30 plus 10 per cent of the average municipal tax burden of the previous year.

**Table 4 — Impact of Ontario Property Tax Credit (Old Age Pensioner)**  
(Dollars)

Gross Income	Gross Property Tax	Average Basic Shelter Grant	Property Tax Credit	Change in Tax Relief
2,500	280	70	116	+46
3,000	300	70	113	+43
4,000	300	70	103	+33
5,000	330	70	96	+26
6,000	330	70	86	+16
7,000	330	70	76	+ 6
8,000	360	70	69	- 1
9,000	370	70	60	-10
10,000	420	70	55	-15
15,000	555	70	18	-52
20,000	680	70	0	-70

- Notes: 1. The pattern of estimated gross property tax is based schematically on the observed distribution in Guelph as projected to 1972. See Appendix.
2. Taxable income used in calculating the property tax credit is based on the new level of personal exemption, the \$650 age exemption and the \$100 standard deduction.
3. The formula for determining basic shelter relief was \$30 plus 10 per cent of the average municipal tax burden of the previous year.

These special tax relief programs are estimated to cost \$35.3 million in 1972 — \$10.0 million in farm tax rebates and \$19.0 million in supplementary tax relief to needy pensioners.

**Table 5 — Tax Relief to G.I.S. Pensioners**  
(Dollars)

Gross Property Tax	Former Tax Relief			1972 Tax Relief		
	Basic Shelter Grant	Total Supple- mentary Assistance	Total	Property Tax Credit	Total Supple- mentary Assistance	Total
150	70	80	150	105	100	205
200	70	100	170	110	100	210
250	70	100	170	115	100	215
300	70	100	170	120	100	220
350	70	100	170	125	100	225
400	70	100	170	130	100	230

- Notes: 1. Some 300,000 Ontario residents 65 years of age or older receive a guaranteed income supplement (G.I.S.) in addition to the old age pension. Single pensioners qualify for G.I.S. if their private income is below \$1,392 while pensioner couples qualify if their private income is below \$2,448.
2. Ontario's supplementary assistance was a flat \$50 to all G.I.S. pensioners and up to a further \$50 depending upon net property taxes paid after deduction of basic shelter relief. In 1972 the additional \$50 may be claimed by a single pensioner up to the limit of his gross property tax levy.
3. The formula for determining the value of basic shelter relief was \$30 plus 10 per cent of average municipal taxes of the previous year.

**Table 6 — Tax Relief to Farmers**  
(Dollars)

Gross Property Tax	Former Tax Relief			1972 Tax Relief		
	Basic Shelter Grant	25% Rebate	Total	Property Tax Credit	25% Rebate	Total
150	70	20	90	105	37	142
200	70	32	102	110	50	160
300	70	58	128	120	75	195
400	70	82	152	130	100	230
500	70	108	178	140	125	265
600	70	132	202	150	150	300
700	70	158	228	160	175	335
1,000	70	232	302	190	250	440

- Notes: 1. This table shows the tax relief provided to farmers who have no taxable income. For farmers whose income is sufficiently high to be liable for income tax, the property tax credit would be reduced accordingly. In 1969, some 38,000 Ontario farmers were liable for income taxation and their average rate of tax was about 13 per cent.
2. In 1972 the 25 per cent farm tax rebate relates to the gross property tax paid by the farmer. While the basic shelter program was in force, the 25 per cent rebate was based on the net property tax after deduction of the basic shelter grant.
3. The formula for determining the value of basic shelter relief was \$30 plus 10 per cent of average municipal taxes of the previous year.

formula which would be simple yet effective.<sup>15</sup> This potential design would provide a sales tax credit of \$10 to the taxfiler plus \$10 for each dependant, minus 1 per cent of taxable income. Like the property tax credit, this structure produces maximum benefit for low-income families and gradually tapers relief up the income scale. Thus, along with the existing exemption on food and necessities, such a tax credit would completely shelter our lowest-income families from the burden of the retail sales tax. Ontario is exploring the possibility of other tax credits to replace health premium assistance and low-income housing subsidies. By means of such tax credits, the total burden of taxes can be lifted from our poorest families and individuals, thereby making real progress towards ensuring them a more decent standard of living.

Equally important, the acceptance of Ontario's tax credit plan by the Government of Canada represents a positive step towards developing a guaranteed income plan for Canadians. The property tax credit plan provides valuable experience in using the income tax system as a refund or payment mechanism. It will generate much new information about people who are too poor to pay income tax and will reward them for filing an income tax form. It will offer a realistic approach towards supplementing the income of our working poor. Eventually it may be adapted as the basic mechanism for underpinning the income of all Canadians and replacing the present myriad of welfare schemes.

<sup>15</sup>See Hon. W. Darcy McKeough, "Preliminary Outline of a System of Property and Sales Tax Credits for Ontario Taxpayers", op. cit.



# THE INCIDENCE OF PROPERTY TAXATION IN AN ONTARIO TEST LOCALITY

## Introduction

In designing a property tax credit scheme, it is critical to identify the relationship between property tax burdens and income. A number of studies have attempted to measure the incidence of taxes levied upon property values.<sup>1</sup> In general, these studies have concluded that property tax is regressive over most of the income scale. However, the data limitations of these previous studies, and the fact that they related to other jurisdictions meant that they were of limited value for purposes of policy formulation by the Ontario government. In view of this, the Ontario Treasury undertook a detailed and comprehensive study of the incidence of property taxation at the income level in a test location in Ontario. This Ontario study is essentially a quantitative computer analysis, which matches the income and property taxes of over 11,000 taxfilers in Guelph. A forthcoming staff report will provide a full report on the methods and findings of the analysis. This appendix summarizes the principal results available to date.<sup>2</sup>

## Guelph in Perspective

Guelph was used as a test location primarily because property tax information in a readily analyzable form was available for that municipality. This raises the question of whether Guelph, as the test locality, is more or less typical of the situation for Ontario as a

whole or whether it is in some respects a special case. Using the following criteria as a basis for comparison, it can be seen that Guelph is indeed reasonably representative of Ontario as a whole and, therefore, a useful basis from which overall conclusions can be drawn.

## Results of the Analysis

A computer model was designed for the specific purpose of testing tax credit schemes against the Guelph data base. The model matches over 11,000 income tax records against property tax records, in order to measure the incidence of property tax by income level and to simulate the revenue and incidence impact of alternative tax credit designs. The base year for both the income tax and property tax data was 1968. Results for 1968 were extrapolated to 1972 on the basis of the observed experience in Guelph from 1969 to 1971 in the case of the property tax, and on the basis of province-wide experience in the case of income.

The Guelph analysis confirms that the property tax is significantly regressive. The findings show that property taxes pre-empt a high proportion of gross income for persons earning below \$3,000, and a decreasing proportion for incomes between \$3,000 and \$6,000. On incomes between \$6,000 and \$12,000 the property tax verges on proportionality, then resumes its regressive pattern above the \$12,000 income range. The regressive burden of the property tax is particularly apparent for two sub-groups of taxpayers — the elderly and young families.

These groups exhibit an average property tax burden very close to that of the total population, yet their incomes are significantly below the average for the population as a whole. Table A-1 displays these relationships between the property tax burden and income levels.

The computer model was also used to compare the impact of Ontario's property tax credit plan versus the former basic shelter grant program.<sup>3</sup> Table A-2 shows that the tax credit plan generates a progressive pattern of tax relief in contrast to the basic shelter grant which provided a flat relief payment to all taxpayers. The cost of the property tax credit plan was also estimated for the Guelph sample of taxpayers and was found to be modestly higher than the cost of continuing the basic shelter grant program.

<sup>1</sup>See Dick Netzer, *Economics of the Property Tax, Studies in Government Finance* (Washington: The Brookings Institution, 1966); Margaret Reid, *Housing and Income* (Chicago: University of Chicago Press, 1962); Report of the Committee of Inquiry into the Impact of Rates on Households (London: H.M.S.O., 1965); and A. R. Ileric, *Allen and After* (London: The Rating and Valuation Association, 1965).

<sup>2</sup>See Staff Study, *Analysis of Income and Property Taxes in Guelph* (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, forthcoming).

<sup>3</sup>The property tax credit formula is \$90 plus 10 per cent of property taxes paid minus 1 per cent of taxable income, up to a maximum credit of \$250.

	1969	
	Guelph	Ontario
Average gross income per taxfiler	\$5,348	\$5,622
Average residential property tax	\$347	\$371
Ratio of residential to total taxable assessment	.609	.604
Ratio of exempt assessment to total assessment	.383 <sup>1</sup>	.216

Source: 1969 Summary of Financial Reports of Municipalities, Vol. I (Toronto: Department of Municipal Affairs, 1970) and, Taxation Statistics (Ottawa: Department of National Revenue, Taxation, 1971).

<sup>1</sup>The high ratio of exempt to total assessment reflects the extensive university and penal reform institutions in Guelph.

**Table A-1 — Summary of Guelph Results**  
(Dollars)

Gross Income Class	Actual 1968	Projection for 1972		
	Average Gross Property Tax	Average Tax as Percentage of Gross Income	Average Gross Property Tax	Average Tax as Percentage of Gross Income
3,000 - 3,500	290	9	334	10
3,500 - 4,000	306	8	329	9
4,000 - 4,500	308	7	330	8
4,500 - 5,000	303	6	335	7
5,000 - 5,500	297	6	343	7
5,500 - 6,000	297	5	333	6
6,000 - 6,500	306	5	328	5
6,500 - 7,000	323	5	329	5
7,000 - 7,500	333	5	331	5
7,500 - 8,000	335	4	348	4
8,000 - 8,500	353	4	357	4
8,500 - 9,000	373	4	374	4
9,000 - 9,500	379	4	372	4
9,500 - 10,000	409	4	378	4
10,000 - 12,000	435	4	416	4
12,000 - 15,000	496	4	484	4
15,000 - 20,000	579	3	555	3
20,000 - 25,000	632	3	679	3
25,000 - 50,000	690	2	729	2

Source: Computer analysis of income tax and property tax records for residents of Guelph.

Note: 1968 is the base year for the computer analysis. Projections for 1972 are made assuming that incomes rise as forecast by the Ontario Treasury and property tax burdens increase in line with the actual experience in Guelph from 1968 to 1971 and a trend projection for 1972.



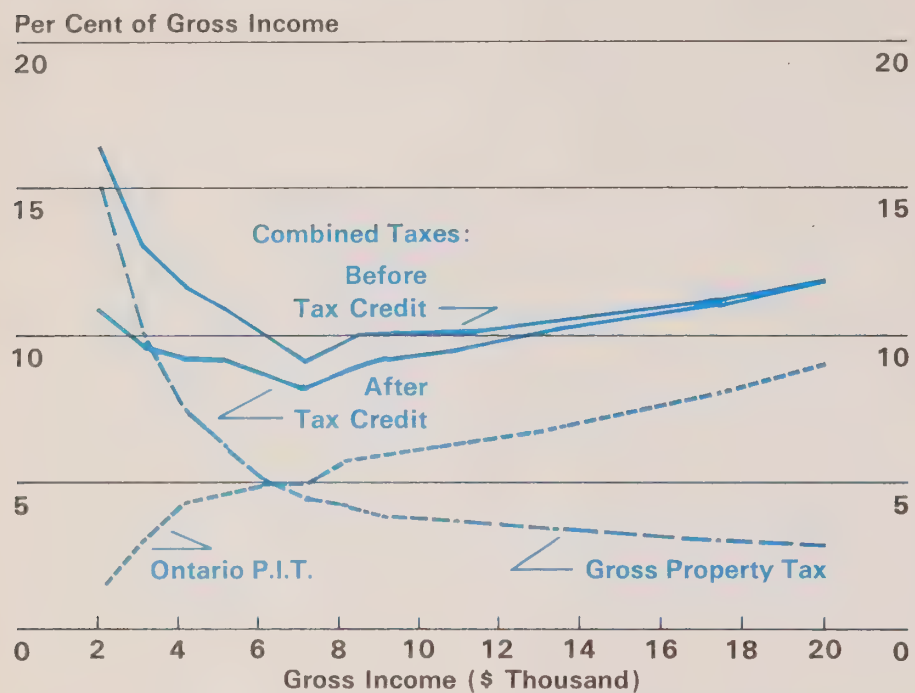
**Table A-2 — Summary of Guelph Results (Projection for 1972)**  
(Dollars)

Income Range	Average Gross Property Tax	Basic Shelter Grant	Average Property Tax Credit	Change in Relief
000 - 3,500	334	66	114	+48
3,500 - 4,000	329	66	109	+43
4,000 - 4,500	330	66	103	+37
4,500 - 5,000	335	66	99	+33
5,000 - 5,500	343	66	96	+30
5,500 - 6,000	333	66	91	+25
6,000 - 6,500	328	66	86	+20
6,500 - 7,000	329	66	81	+15
7,000 - 7,500	331	66	77	+11
7,500 - 8,000	348	66	74	+ 8
8,000 - 8,500	357	66	72	+ 6
8,500 - 9,000	374	66	68	+ 2
9,000 - 9,500	372	66	63	- 3
9,500 - 10,000	378	66	57	- 9
10,000 - 12,000	416	66	52	-14
12,000 - 15,000	484	66	35	-31
15,000 - 20,000	555	66	13	-53
20,000 - 25,000	679	66	3	-63
25,000 - 50,000	729	66	0	-66

*Source: Computer analysis of income tax and property tax records for residents of Guelph.*

- Notes:*
1. The analysis is undertaken assuming Bill C-259 to have been in effect in both 1968 and 1972.
  2. For purposes of comparison it is assumed that the basic shelter grant formula applies in 1972 and average property tax levies in Guelph increase in line with the actual experience in Guelph from 1968 to 1971 and a trend projection for 1972.

Chart A-1—Incidence of Property and Income Taxes in Guelph, as Projected to 1972



Source: Computer analysis of matched income and assessment roll records for residents of Guelph.



# Selected Economic Indicators

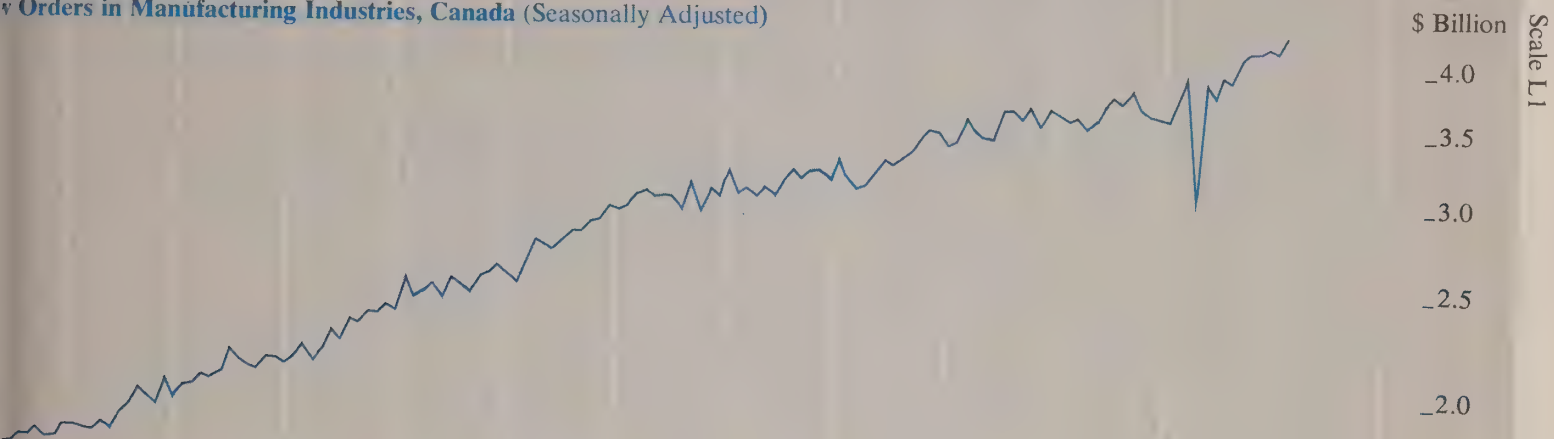
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## Leading Indicators

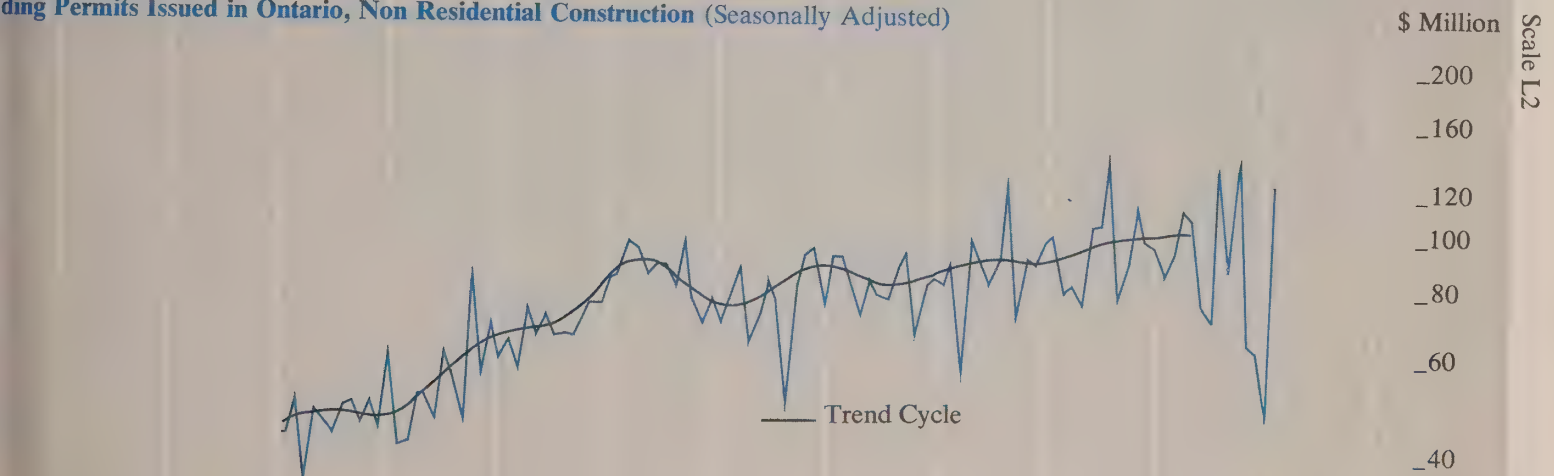
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



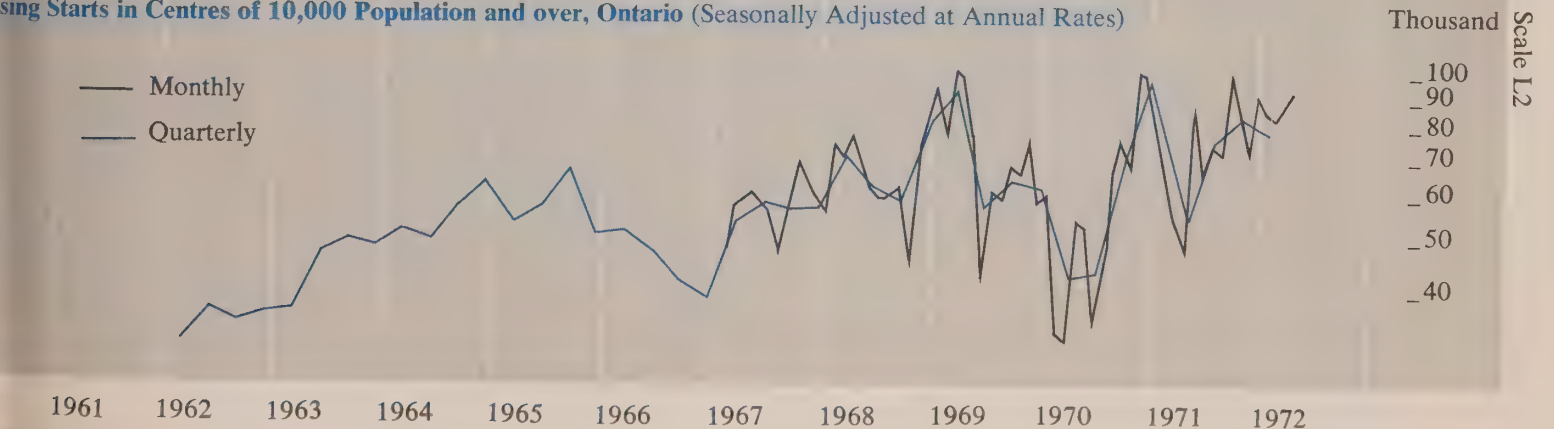
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)

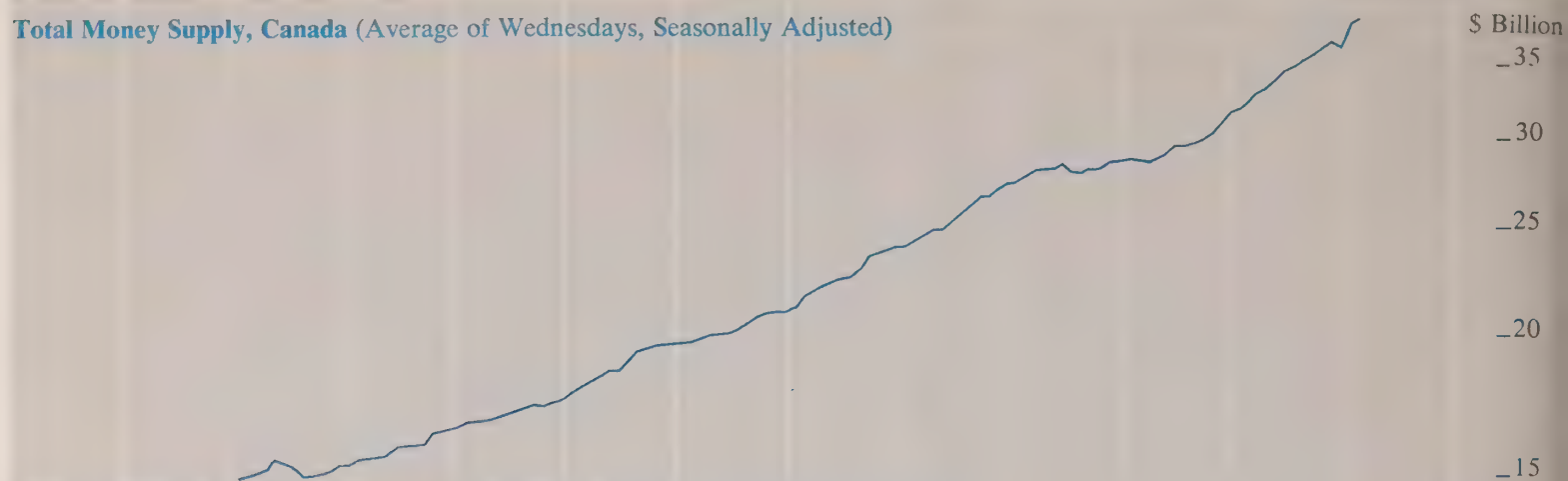


Building Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)

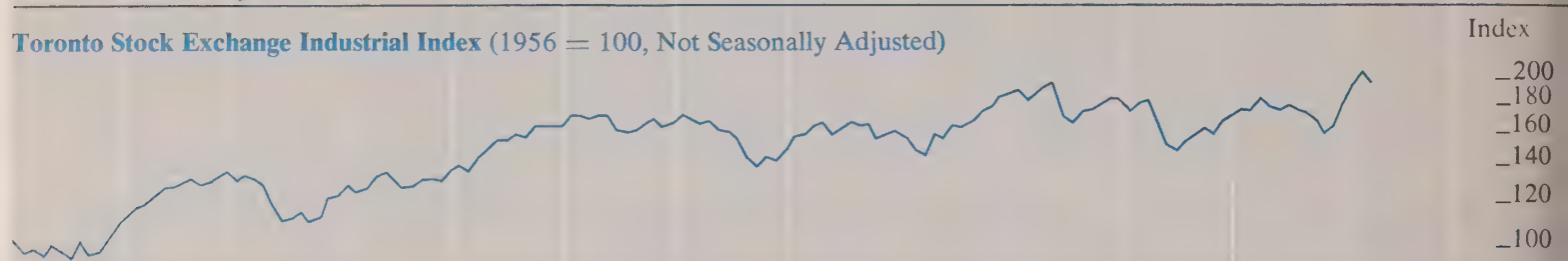


# Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

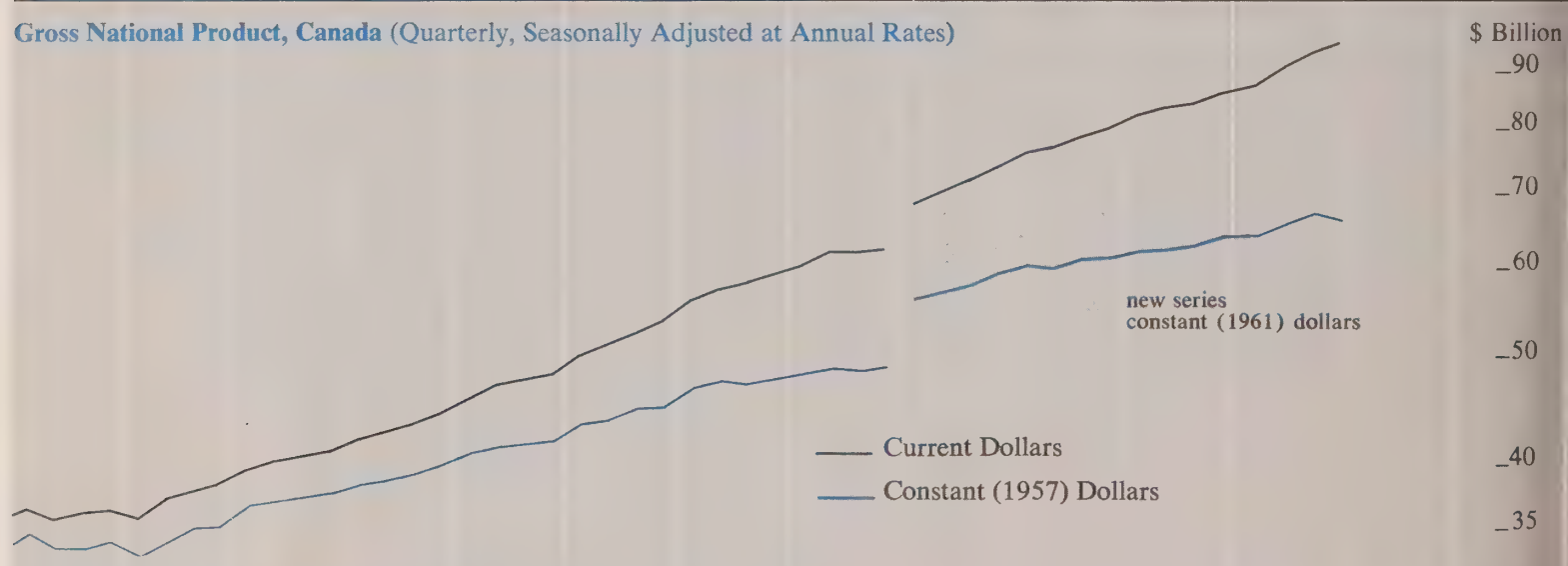


**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

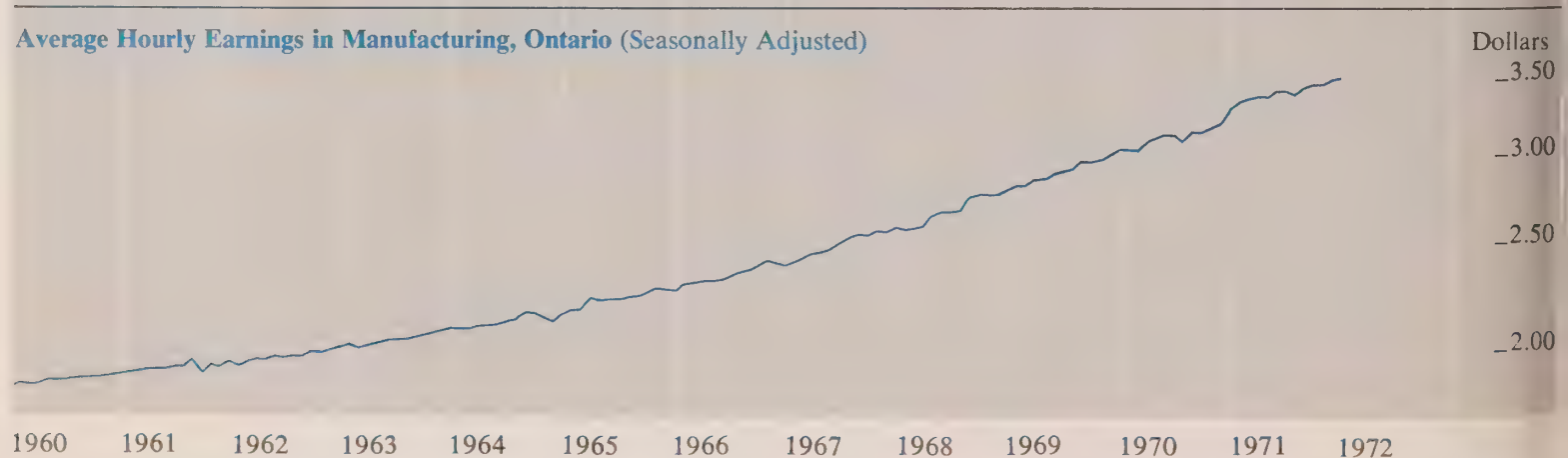


## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)



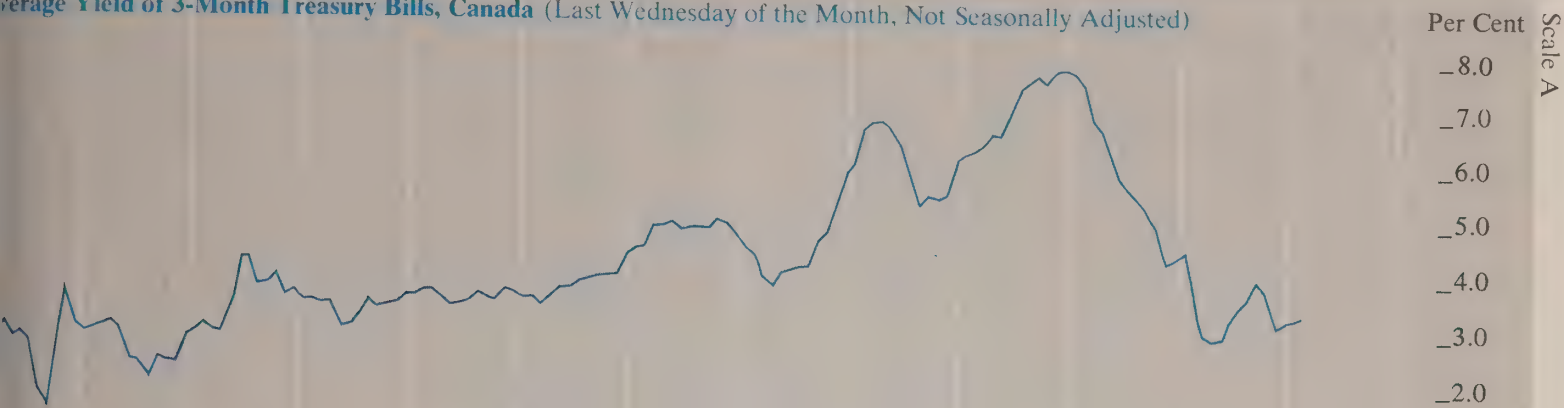
**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)





## Coincidental and Lagging Indicators

Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



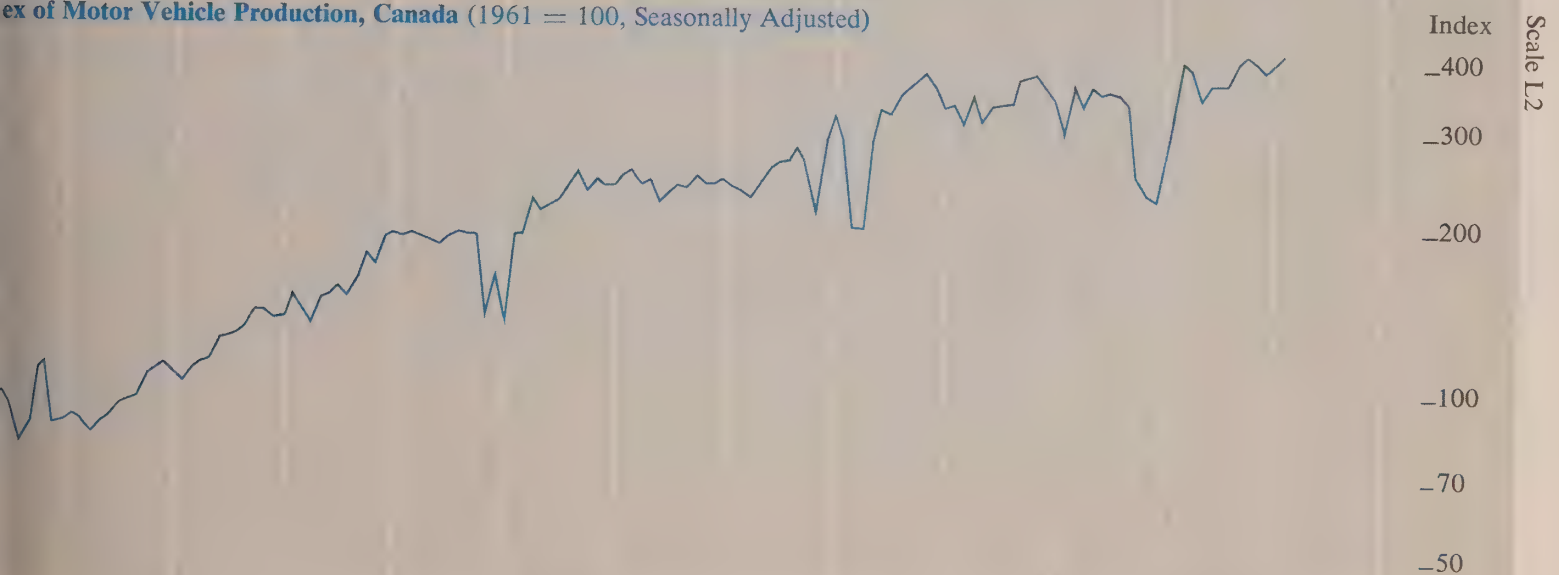
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

Seasonally Adjusted

## Leading Indicators

	1971												1972	
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Average Weekly Hours Worked in Manufacturing	39.2	39.5	39.9	39.8	39.2	40.0	39.8	39.8	39.8	40.0	40.0	40.4		
New Orders in Manufacturing Industries <sup>c</sup>	\$ Million	3,846.0	4,084.8	4,100.2	4,045.6	3,981.3	4,130.2	3,993.7	4,267.3	4,334.7	4,216.9	4,267.0	4,216.1	4,370.4
Building Permits Issued in Ontario, Non-Residential Construction	\$ Million	97.0	117.5	112.0	77.1	74.9	139.8	92.6	146.2	67.3	64.6	48.4	128.3	
Urban Housing Starts (Annual Rate)	Number	65,800	64,100	48,400	88,000	67,900	75,000	73,000	99,400	82,900	73,600	98,500	77,500	82,900 123,100
Money Supply <sup>c</sup>	\$ Million	32,083	32,540	33,131	33,526	34,281	34,686	35,009	35,456	35,978	36,406	36,964	37,423	38,281 38,671
T.S.E. Industrial Index <sup>u</sup>	1956 = 100	178.1	177.4	185.3	181.6	177.8	180.7	177.5	176.3	169.9	160.8	166.2	181.6	197.3 203.6
Business Failures <sup>u</sup>	Number	71	70	100	81	88	66	60	55	40	78	94	61	44 61
Business Failures — Liabilities <sup>u</sup>	\$ Million	11.6	4.5	5.2	3.8	3.4	5.3	8.0	5.3	2.1	5.6	5.7	3.7	3.4 4.7

## Coincidental and Lagging Indicators

	1971												1972	
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
Gross National Product <sup>c</sup> (Annual Rate)	\$ Million		88,432			91,156			93,344			95,572		
Average Hourly Earnings in Manufacturing	Dollars	3.37	3.43	3.42	3.44	3.46	3.48	3.46	3.47	3.49	3.51	3.52	3.53	
3-Month Treasury Bill Rate <sup>u</sup>	Per Cent	4.68	4.06	3.16	3.00	3.03	3.37	3.68	3.79	4.06	3.47	3.24	3.21	3.36
Cheques Cashied in Clearing Centres <sup>l</sup>	\$ Million	6,589	7,200	7,956	7,519	7,062	7,110	7,457	7,843	7,988	8,291	8,248	8,098	7,627 3.45
Retail Trade	\$ Million	900	941	947	995	992	989	983	972	1,000	1,001	1,030	1,003	1,031
Labour Force	000's	3,226	3,233	3,214	3,216	3,222	3,229	3,233	3,234	3,269	3,287	3,309	3,320	3,359
Employed	000's	3,041	3,048	3,041	3,029	3,050	3,060	3,081	3,118	3,106	3,118	3,136	3,159	3,174
Unemployed	000's	172	169	162	180	171	164	150	164	179	186	185	165	162 151
Unemployed as % of Labour Force	Per Cent	5.4	5.3	5.1	5.6	5.3	5.1	4.6	5.1	5.4	5.6	5.6	5.0	4.8 4.5
Wages and Salaries	\$ Million	1,640	1,669	1,685	1,707	1,742	1,754	1,744	1,763	1,775	1,771	1,782	1,786	
Index of Industrial Employment	1961 = 100	130.9	131.0	131.4	132.3	133.1	133.8	132.6	132.2	132.8	132.3	130.6	130.8	130.5

Index of Industrial Production <sup>c</sup>	1961 = 100	174.0	173.5	174.5	173.6	174.7	175.5	176.2	179.5	180.5	181.9	181.7	183.3	183.9	183.9
Total Manufacturing <sup>c</sup>		170.0	169.7	170.5	170.2	171.2	171.8	171.9	175.1	176.1	178.7	176.8	178.0	179.5	178.8
Non-Durables <sup>c</sup>		154.5	150.4	152.6	152.6	154.1	154.6	154.6	156.3	156.8	159.1	158.2	159.5	160.1	158.3
Durables <sup>c</sup>		189.5	194.2	193.1	192.5	192.8	193.5	193.7	198.9	200.5	203.5	200.2	201.4	204.1	204.8
Mining <sup>c</sup>		178.3	175.5	178.0	175.2	179.3	180.7	184.0	184.4	185.6	183.0	188.6	191.6	187.8	188.2
Electric Power and Gas Utilities <sup>c</sup>		202.4	202.3	203.9	200.2	197.4	198.8	201.1	208.9	210.6	207.9	212.7	215.4	214.8	220.6
Primary Energy Demand (Annual Rate)	BKWH	67.62	67.76	68.14	67.21	65.74	67.86	67.33	69.82	71.13	68.06	70.26	68.83	70.19	72.37
Exports (including re-exports) <sup>c</sup>	\$ Million	1,439	1,391	1,503	1,395	1,464	1,550	1,446	1,516	1,522	1,545	1,516	1,495	1,462	1,570
Imports <sup>c</sup>	\$ Million	1,128	1,181	1,339	1,181	1,279	1,343	1,321	1,387	1,284	1,467	1,359	1,345	1,473	1,442

## Unclassified Indicators

Foreign Exchange Reserves <sup>c,u</sup>	U.S. \$ Million	3,816	3,868	3,944	3,962	3,998	3,977	4,056	4,319	4,308	4,379	4,573	4,852	4,838	4,841
Industrial Materials Price Index <sup>u</sup>	1935-39 = 100	264.2	266.0	266.4	267.6	267.1	267.4	266.6	267.4	267.1	266.9	268.5	2,698	277.1	137.3
Consumer Price Index <sup>u</sup>	1961 = 100	130.3	130.9	131.3	132.2	132.7	133.0	134.1	135.0	134.7	134.9	135.4	136.3	136.7	137.3
Toronto <sup>u</sup>		126.7	127.2	127.7	128.3	129.2	129.5	130.2	130.6	130.7	130.2	130.5	131.6	132.0	132.8
Ottawa <sup>u</sup>		127.5	128.3	129.0	129.7	130.5	130.9	131.8	132.0	131.7	131.6	132.3	133.0	133.6	133.9
Thunder Bay <sup>u</sup>		102.0	102.3	102.6	103.0	103.5	103.7	104.2	104.6	105.2	104.8	104.9	105.4	105.8	106.3
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>	1969 = 100	0.77	0.76	0.76	0.76	0.75	0.75	0.75	0.74	0.74	0.74	0.74	0.73	0.73	0.73

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>l</sup>Ontario less Toronto.











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Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics

H. Ian Macdonald, Deputy Minister

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*Treasurer of Ontario and Minister of Economics*  
H. Ian Macdonald  
*Deputy Minister*

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# Sectoral Characteristics of the Ontario Structure of Production

A. Kubursi and R. H. Frank\*

## INTRODUCTION

onal income statistics such as those on "Gross National Product", "Disposable Income", and "Personal Consumption Expenditures" have often been used to describe the working of the economic system. Recently, however, economists have found it necessary to penetrate below the surface of statistical statistics, and to examine the structural interdependence of the system.<sup>1</sup>

It is now generally recognized that each economic system has a complicated internal structure that determines its performance, and that the study of this internal structure has become indispensable to the proper understanding and control of the economy. It is perhaps why, over the past few decades, the internal economic framework of a large number of countries and regions has been described by a technique known as "input-output" analysis.

The basic tool of this body of analysis is the "inter-industry" table which consists of a set of linear formulae connecting the levels of activity of the various sectors of an economy.<sup>2</sup> Each sector is considered to "buy" its inputs from other sectors and to sell its outputs to other sectors, and in the "open" portion of the system, to an "autonomous sector" which has no output of its own. The "autonomous sector", if there is one, represents final demand and is unexplained within the model. The major advantage of this table is that it reveals the indirect relationships of the economic system and facilitates the economic justification and interpretation of the indirect relationships and their consequences by input-output analysis.

This paper is an attempt to use the input-output system of Ontario<sup>3</sup> as a basis for a detailed analysis of some of the economic and technical implications of sectoral interdependencies in the Ontario economy. In particular we shall examine and determine the implications of the following:

1) the nature and extent of indirect and induced links among the various sectors of the economy;

2) the various primary and induced income and employment multipliers of each sector;

3) the different types of productive sectors classified according to their input uses and output distribution;

4) the nature and extent of backward linkages among sectors;

5) the nature and extent of forward linkages among sectors;

6) the determination of measures of dispersion of the various coefficients of linkages;

7) the identification of "key" sectors of Ontario's economy;

8) the nature and extent of dependence of the various sectors on the various categories of final demand, and

9) the construction of an overall index of performance for each sector of production.

The general plan of this paper is to consider each of these topics separately. We shall start with the question of determining the direct, indirect and induced output effects of each sector in response to a dollar change in the final demand of any sector  $j$ .<sup>4</sup>

## II THE NATURE AND STRENGTH OF INDIRECT AND INDUCED SECTORAL LINKS

The technical input-output matrix reveals the direct connection of an industry with others. However, an industry may directly sell to or buy from only a few industries, but its customers and suppliers may be connected with many industries. This industry may thus have a profound influence on the economy through its indirect relations with other industries. Therefore, it is essential that one considers all direct and indirect relations that a given industry has with all other industries.

To evaluate the direct and indirect relations an industry has with other industries, we have to evaluate the "matrix multiplier"  $(\mathbf{I} - \mathbf{A})^{-1}$ . This is so since the gross output levels  $\mathbf{x}$ 's required to sustain a given vector of final demand  $\mathbf{f}$  in the open model is determined by the following equation system:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{f} \quad (1)$$

If the inverse of the  $(\mathbf{I} - \mathbf{A})$  matrix exists, it may be expressed by means of the binomial expansion:<sup>5</sup>

$$\begin{aligned} (\mathbf{I} - \mathbf{A})^{-1} &= \mathbf{I}^{-1} + (-1) \mathbf{I}^{-2} (-\mathbf{A}) + \\ &\quad \frac{(-1)(-2)}{2!} \mathbf{I}^{-3} (-\mathbf{A})^2 + \quad (2) \\ &\quad \frac{(-1)(-2)(-3)}{3!} \mathbf{I}^{-4} (-\mathbf{A})^3 + \dots \end{aligned}$$

$$\begin{aligned} &= \mathbf{I} + \mathbf{A} + \mathbf{A}^2 + \mathbf{A}^3 + \dots \\ &= \mathbf{I} + \mathbf{A} + \mathbf{A}^2 + \mathbf{A}^3 + \mathbf{A}^4 + \dots \\ &= \sum_{k=0}^{\infty} \mathbf{A}^k \end{aligned}$$

The inverse matrix,  $(\mathbf{I} - \mathbf{A})^{-1}$ , indicates the total direct plus indirect output required per unit of final demand. The series in (2) simply explains the general composition of this total output requirement. The first term,  $\mathbf{I}$ , accounts for the one unit of output to be delivered to final demand. The second term,  $\mathbf{A}$ , indicates the direct input required to produce this unit of final demand. The next term,  $\mathbf{A}^2$ , indicates first-round indirect inputs required to produce the direct input  $\mathbf{A}$ , etc.<sup>6</sup> Due to the fact that the elements of the  $\mathbf{A}$  matrix satisfy the Hawkins-Simon condition,  $a_{ij}^{(k)}$  decreases as  $k$  increases and the  $(\mathbf{I} - \mathbf{A})^{-1}$  is approximated by the sum of the powers of  $\mathbf{A}$ .

If we represent the elements of the  $(\mathbf{I} - \mathbf{A})^{-1}$  matrix by  $c_{ij}$ 's, the sum of the column elements of the  $(\mathbf{I} - \mathbf{A})^{-1}$

<sup>1</sup>W. W. Leontief, *Input-Output Economics* (Oxford: Oxford University Press, 1966).

<sup>2</sup>Robert Dorfman, "The Nature and Significance of Input-Output", *Review of Economics and Statistics*, (May, 1954).

<sup>3</sup>R. H. Frank, S. M. Batrik and D. Haronitis, "The Input-Output Structure of the Ontario Economy", *Ontario Economic Review*, (Jan./Feb. 1970).

<sup>4</sup>It is generally assumed throughout the paper that the reader is familiar with the basic techniques of input-output analysis. Introduction to Input-Output Economics (New York: Holt, Rinehart and Winston, 1969) by Chiou-Shang Yan provides an elementary exposition of this subject.

<sup>5</sup>The system  $\sum_{k=0}^{\infty} \mathbf{A}^k = (\mathbf{I} - \mathbf{A})^{-1}$  is not true

for any arbitrary  $\mathbf{A}$ , but it holds when  $\mathbf{A}$  satisfies the following conditions:

(1)  $0 \leq a_{ij} < 1$  for all  $(i, j)$ ,

(2)  $\sum_{i=1}^n a_{ij} < 1$  for all  $j$ .

These two conditions are generally known as the Hawkins-Simon Condition. For further details see, D. Hawkins and H. A. Simon, "Note: Some Conditions of Macroeconomic Stability", *Econometrica*, (July - October, 1949).

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$$\sum_{i=1}^n c_{ij} = c_{.j} \quad (3)$$

indicates the total input requirements (direct plus indirect) for a unit increase in the final demand for industry  $j$ . This is so since from (1) we have,

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1} \mathbf{f}$$

If we replace the vector  $\mathbf{f}$  in (1) by another column vector  $\mathbf{e}$  whose entries are all zeros except in the  $j$ th position where we have one, we obtain:

$$\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix} = \begin{bmatrix} c_{11} & \dots & c_{1n} \\ \vdots & \ddots & \vdots \\ c_{n1} & \dots & c_{nn} \end{bmatrix} \begin{bmatrix} 0 \\ 0 \\ \vdots \\ 1 \\ \vdots \\ 0 \end{bmatrix} = \begin{bmatrix} c_{1j} \\ \vdots \\ c_{nj} \end{bmatrix} \quad (4)$$

The total output effect in (3) is obviously the sum of the column vector  $(c_{1j}, c_{2j}, \dots, c_{nj})$  in (4). This total output effect of a dollar increase in the final demand in sector  $j$  takes into account only the repercussions of the initial change in the final demand for that sector. But the repercussions of the initial unit change in sector  $j$ 's final demand do not terminate here. In fact there is additional income generated in the process of producing an extra dollar of output  $j$  and this is bound to induce more consumption and consequently more production.

To evaluate the overall output effect (direct plus indirect plus induced) within the input-output framework we have to relate consumption to value added in such a way that consumption may be considered as

the "input" necessary to produce the "output" of income. In other words we have to treat households as a production sector.

Let us define a new matrix  $\mathbf{B}$  such that:

$$\mathbf{B} = \begin{bmatrix} \mathbf{A} & \mathbf{c}^* \\ \mathbf{h} & \mathbf{o} \end{bmatrix} \quad (5)$$

where  $\mathbf{h}$  represents a row vector of value added per unit of output in each sector;

$\mathbf{c}^*$  is a column vector of average propensity to consume per industry, the typical  $c_i^* = \frac{c_i}{\eta}$  where  $\eta$  is total income and  $c_i$  is consumption from industry  $i$ ;

$\mathbf{A}$  is the technical coefficient matrix. The input-output system will now appear as:

$$(\mathbf{I} - \mathbf{B}) \mathbf{x}^* = \mathbf{f}^* \quad (6)$$

where  $\mathbf{x}^* = \begin{bmatrix} \mathbf{x} \\ \eta \end{bmatrix}$  and  $\mathbf{f}^* = \begin{bmatrix} \mathbf{f}^a \\ \mathbf{o} \end{bmatrix}$  where  $\mathbf{f}^a$  is  $\mathbf{f}$

exclusive of consumption.

In a less compact form (6) appears as follows:

$$\begin{bmatrix} \mathbf{I} - \mathbf{A} & -\mathbf{c}^* \\ -\mathbf{h} & \mathbf{1} \end{bmatrix} \begin{bmatrix} \mathbf{x} \\ \eta \end{bmatrix} = \begin{bmatrix} \mathbf{f}^a \\ \mathbf{o} \end{bmatrix} \quad (7)$$

The solution of this system, if it exists, is represented by (8):

$$\begin{bmatrix} \mathbf{x} \\ \eta \end{bmatrix} = \begin{bmatrix} \mathbf{I} - \mathbf{A} & -\mathbf{c}^* \\ -\mathbf{h} & \mathbf{1} \end{bmatrix}^{-1} \begin{bmatrix} \mathbf{f}^a \\ \mathbf{o} \end{bmatrix} \quad (8)$$

If we denote the elements of the  $(\mathbf{I} - \mathbf{B})^{-1}$  matrix by  $b_{ij}$ 's, the sum of the column elements:

$$\sum_{i=1}^n b_{ij} = b_{.j} \quad \text{for all } j = 1, \dots, n \quad (9)$$

indicates the total direct plus indirect induced output effects per dollar increase in the final demand of the  $j$ th industry. It is interesting to note that the last row of  $(\mathbf{I} - \mathbf{B})^{-1}$  matrix represents the "output" of households must produce per dollar of demand of each industry. Since the "output" of households is exactly the income earned by households, the last row in fact indicates the total income generated from one dollar of final demand of each industry. It includes not only the direct and indirect induced effects but also the induced income effects. This follows from the fact that we include households in the production sectors which enables us to take into account increases in consumption due to increases in income.

To separate the total induced output effects per dollar increase in the final demand of, say, industry  $j$ , we have to subtract equation (3) from (9). Let

$$Y_j = b_{.j} - c_{.j} = \sum_{i=1}^n (b_{ij} - c_{ij}) \quad \text{for all } j = 1, \dots, n.$$

Similarly, the total indirect output effect of a dollar increase in the final demand of the  $j$ th industry may be written as:

$$\Phi_j = (c_{.j} - a_{.j}) = \sum_{i=1}^n (c_{ij} - a_{ij}) \quad \text{for all } j = 1, \dots, n.$$

The total direct output effects per dollar increase in the final demand of the  $j$ th industry are then:

$$\beta_j = a_{.j} = \sum_{i=1}^n a_{ij} \quad \text{for all } j = 1, \dots, n.$$

where  $a_{ij}$  is the amount of resource  $i$  needed to produce one dollar's worth of output in sector  $j$ .

The  $Y_j$ ,  $\Phi_j$  and  $\beta_j$  are represented for sector  $j$  in Table 1 and their relative magnitudes are visualized in Chart 1.

From Table 1 and Chart 1 we are able to see that a dollar increase in the final demand of sector (3), (Meat and Poultry), results in the largest total direct plus indirect induced output effect. Next in magnitude is sector (8), (Other Food Industries) followed by sector (4), (Dairy Products).

It is interesting to note that the largest total output effects are produced by increases in the final demand of the "food" producing sectors. On the other

<sup>6</sup>Let us illustrate this by a hypothetical  $n$ -sectors example.

$$\text{Let } A^2 = \begin{bmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \dots & a_{nn} \end{bmatrix} \begin{bmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \dots & a_{nn} \end{bmatrix} = \begin{bmatrix} \sum_{k=1}^n a_{1k}a_{k1} & \dots & \sum_{k=1}^n a_{1k}a_{kn} \\ \vdots & \ddots & \vdots \\ \sum_{k=1}^n a_{nk}a_{k1} & \dots & \sum_{k=1}^n a_{nk}a_{kn} \end{bmatrix}$$

If we denote the  $(i, j)$ th element of  $A^2$  by  $a_{ij}^{(2)}$ , it is then true that the element  $a_{ij}^{(2)}$  is the product of the  $i$ th row and the  $j$ th column of matrix  $A$ . The  $j$ th column of  $A$  indicates the input required to produce one unit of output  $j$ ; and the  $i$ th row of  $A$  indicates the input of the  $i$ th sector needed to produce one unit of output in each sector. Therefore  $a_{ij}^{(2)}$  is precisely the amount of sector  $i$  goods needed to produce the direct inputs needed to produce the direct input requirements of one unit of final demand for product  $j$ .

<sup>7</sup>The SIC's belonging to each sector are reported in Table A2 in the Appendix.



smallest total output effects are produced by increases in the final demands of Utilities; Mining; and Distilleries, Breweries and Wineries.

Upon examining the three components of total output effects we find that the Communications and Other Services sector contributes the largest total induced output effect. For Vehicles and Aircraft, and Agriculture, Forestry and Fishing rank second and third respectively. It is not surprising that the larger the coefficient  $c_j^*$  is, the larger the total output effect of a dollar increase in final demand of sector  $j$ .

The largest total indirect output effects are generated by increases in the final demands of Plastics and Synthetic Resins; Meat and Poultry; Dairy Products; Other Food Products; Leather and Leather Products; Paint and Varnish. The largest total direct output effects are produced by Plastics and Synthetic Resins; Petroleum Refineries and Chemicals; Meat and Poultry and Dairy Products.

It is rather difficult to explain the factors that determine these rankings without disaggregating the total effects into their respective components. Consequently, we proceeded to break-down the elements of  $b_{ij}$ , and  $a_{ij}$ . Thus, let

$$Y_{ij} = b_{ij} - c_{ij}$$

$$\text{all } (i = 1, \dots, n; j = 1, \dots, n) \quad (13)$$

$$\Phi_{ij} = c_{ij} - a_{ij}$$

$$\text{all } (i = 1, \dots, n; j = 1, \dots, n) \quad (14)$$

$$\beta_{ij} = a_{ij}$$

$$\text{all } (i = 1, \dots, n; j = 1, \dots, n) \quad (15)$$

Indices in (13), (14) and (15) reveal the detailed composition of the direct, indirect and induced output effects in every sector  $i$  generated in response to a dollar increase in the final demand of the  $j^{\text{th}}$  sector. Table A1 in the Appendix presents these coefficients for the 49 sectors. Every entry in this table consists of three items arranged in the following order  $\beta_{ij}$ . For instance, a

$\Phi_{ij}$

$Y_{ij}$

A one dollar increase in the final demand of Agricultural goods will result in  $\beta_{11} = .06656$

$$\Phi_{11} = 1.06193$$

$$Y_{11} = .16051$$

its worth of direct, indirect and induced

Chart 1 – Total Direct, Indirect, and Induced Output Effects by Industry

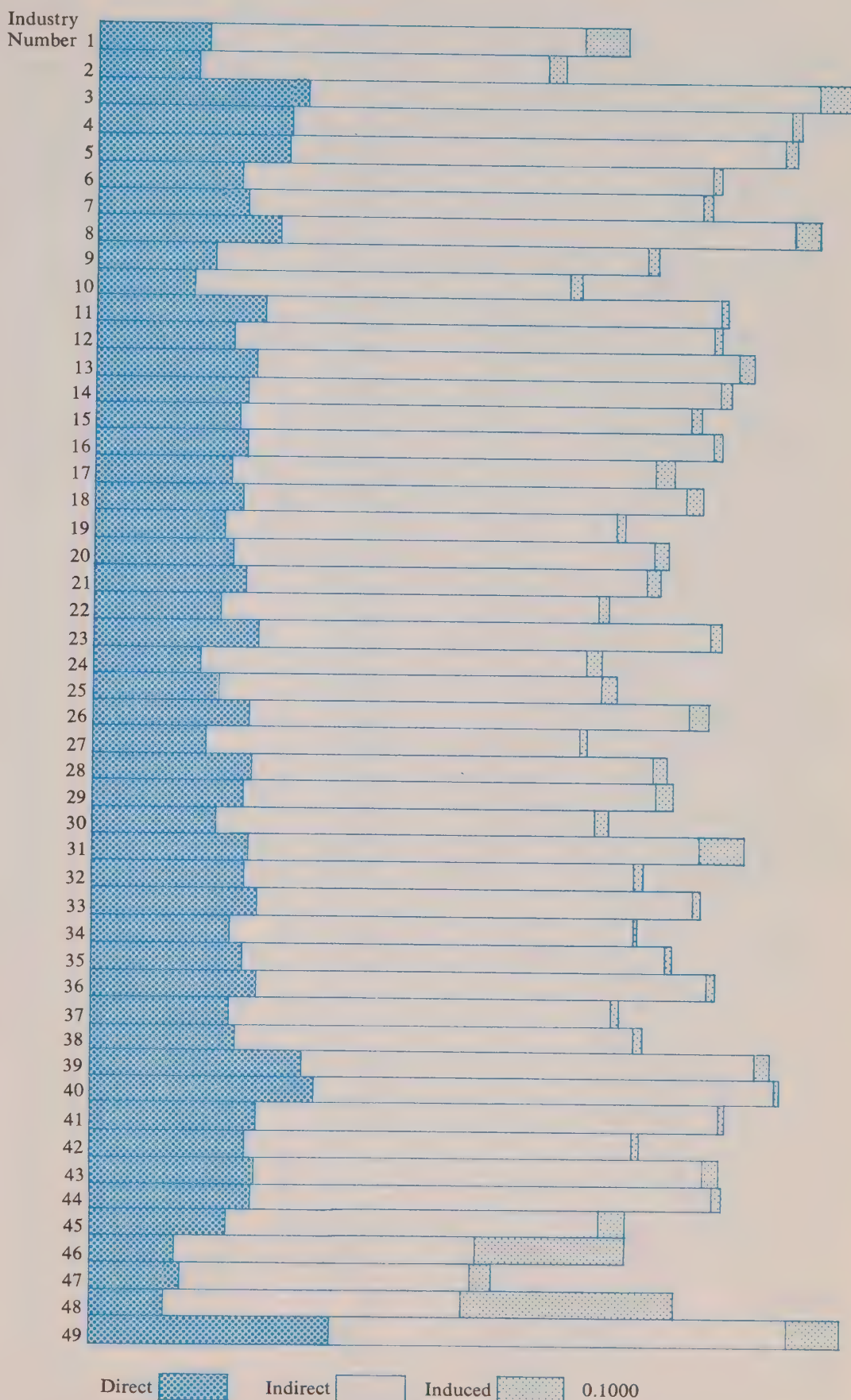


Table 1 – Total Direct, Indirect and Induced Output Effects

Industry No.	Industry	Total Direct Effect	Total Indirect Effect	Total Induced Effect
1	Agriculture, Forestry and Fishing	.47408	1.63964	.16051
2	Mining	.42647	1.54553	.06259
3	Meat and Poultry	.86032	2.21302	.10363
4	Dairy Products	.81443	2.12750	.03709
5	Grain Mills	.81210	2.09079	.04436
6	Biscuits and Bakeries	.60415	1.99691	.02395
7	Sugar and Confectioneries	.62622	1.93680	.02708
8	Other Food Industries	.76988	2.18242	.09097
9	Soft Drinks	.52866	1.82512	.01173
10	Distilleries, Breweries and Wineries	.40544	1.60286	.02111
11	Tobacco and Tobacco Products	.73507	1.95699	.00785
12	Rubber Products	.59199	1.97967	.01972
13	Leather and Leather Products	.65154	2.07491	.01766
14	Cotton Yarn and Cloth	.64075	1.97003	.02856
15	Synthetic Textiles	.62017	1.92368	.03485
16	Knitting Mills	.64691	1.95943	.01176
17	Clothing Industries	.57036	1.81569	.06937
18	Other Textile Mills	.60667	1.90655	.04215
19	Sawmills	.54558	1.64641	.00929
20	Furniture and Fixtures	.57684	1.78080	.02102
21	Other Wood Industries	.60675	1.71712	.00985
22	Pulp and Paper Mills	.52267	1.61523	.02908
23	Paper Products	.67405	1.94074	.03598
24	Printing and Publishing	.45500	1.57203	.04599
25	Iron and Steel Mills	.50169	1.60149	.05880
26	Other Primary Metals	.65004	1.89010	.05481
27	Fabricated and Structural Metals	.49927	1.59339	.00456
28	Metal Stamping, Pressing and Coating	.65076	1.77256	.01524
29	Other Metal Fabricating Industries	.61467	1.81530	.06398
30	Miscellaneous Machinery	.52854	1.64217	.00763
31	Motor Vehicles and Aircraft	.64927	1.93237	.23033
32	Other Transportation Equipment	.64358	1.85198	.01090
33	Electrical Appliances	.65549	1.86361	.01421
34	Electrical Industrial Equipment	.55443	1.75946	.00437
35	Communication Equipment	.60156	1.85025	.01555
36	Other Electrical Products	.66335	1.96815	.00825
37	Clay, Lime and Cement	.55693	1.67036	.01073
38	Other Non-metallic Mineral Products	.57137	1.76339	.01638
39	Petroleum Refineries and Coal Products	.86372	1.92568	.07296
40	Plastics and Synthetic Resins	.90566	2.49589	.01493
41	Paint and Varnish	.67557	2.07850	.01038
42	Pharmaceuticals and Medicines	.62516	1.93170	.01671
43	Other Chemical Industries	.64449	1.95212	.07358
44	Miscellaneous Manufacturing Industries	.63064	2.01431	.03998
45	Construction, Maintenance and Repair	.54080	1.63324	.09376
46	Transportation, Storage and Trade	.31570	1.37097	.64264
47	Utilities	.33609	1.28666	.08516
48	Communications and Other Services	.26441	1.31835	.89616
49	Unallocated Sector	.99847	1.98357	.20308

output effects in the Agricultural sector respectively. Accordingly, Table A1 allows to assess the various direct, indirect and induced linkages among sectors and serves as a basis for the development of various coefficients of linkages in the system.

A matter related to the direct, indirect and induced output effects of a dollar increase in the final demand of a given sector, is the income effects of that change. The mapping of output into income in the input-output context turns out to be a simple matter if the information needed to carry the mappings are part of the input-output system.

### III SECTORAL INCOME AND EMPLOYMENT MULTIPLIERS IN THE ONTARIO ECONOMY

The macro "Keynesian" multipliers and in particular the income multipliers are simply the overall total of direct and indirect effects of a dollar increase in final demand. The summing of direct and indirect income effects is quite similar to the summing of direct and indirect output effects in the input-output context discussed in the preceding section. In fact, it is also possible to use the input-output techniques to evaluate the income effect due to a change in final demand. By its very nature macroeconomics is concerned with the economy at large, strictly at the most general level and this is also true of its income multipliers. The question of what industries will produce extra output when final demand is increased is irrelevant to macroeconomic analysis. A shortcoming of macroanalysis can, however, be eliminated if the input-output method is used instead.<sup>8</sup> Input-output analysis deals with smaller components of the economy than macroeconomics and its emphasis is on individual sectors not the national total.

Starting with the input-output system (1) we may change the gross output vector into total income  $\eta$ :

$$\eta = h(I - A)^{-1} f$$

The relationship (16) can be allocated to industries by post multiplying it by the standard basis vector  $e_j$  instead of the vector  $f$ . Thus:

$$\eta_j = h(I - A)^{-1} e_j$$

The vector of incomes generated directly and indirectly by a dollar increase in the demand of the various sectors will then be

$$y = h(I - A)^{-1}$$

<sup>8</sup>C. Yan, *Ibid.*, pp. 65 - 69.



Table 2 — Simple and Induced Income and Employment Multipliers

Industry	Value Added Per Dollar's Worth of Output	Wage Value Added Per Dollar's Worth of Output	Income Multiplier — No Induced Effects	Income Multiplier With Induced Effects	Employment Multiplier — No Induced Effects	Employment Multiplier With Induced Effects
Agriculture, Forestry and Fishing	.53	.10	1.56551	4.42093	2.61825	9.64012
Mining	.57	.21	1.06281	3.00137	1.20423	3.66218
Meat and Poultry	.14	.10	5.55516	15.68770	3.21226	9.58030
Dairy Products	.19	.14	5.16308	14.58039	3.12255	8.91324
Grain Mills	.19	.10	3.33570	9.41984	2.83987	8.33129
Biscuits and Bakeries	.40	.29	2.29001	6.46690	1.78403	4.35328
Sugar and Confectioneries	.37	.19	1.59182	4.49523	1.54746	4.14983
Other Food Industries	.23	.11	2.97304	8.39578	2.73231	7.78172
Soft Drinks	.47	.30	1.41421	3.99373	1.25616	3.11889
Distilleries, Breweries and Wineries	.59	.16	1.24670	3.52069	1.62957	5.45368
Tobacco and Tobacco Products	.26	.08	3.66651	10.35412	4.14729	13.75671
Rubber Products	.41	.23	2.05230	5.79555	1.90315	4.91473
Leather and Leather Products	.35	.30	2.11598	5.97553	1.59196	3.64223
Cotton Yarn and Cloth	.36	.25	1.05007	2.96536	.89556	2.16005
Synthetic Textiles	.38	.18	1.56639	4.42340	1.57950	4.31561
Knitting Mills	.35	.24	2.61159	7.37512	2.16554	5.35004
Clothing Industries	.43	.24	.89359	2.52344	.86169	2.21388
Other Textile Mills	.39	.18	1.63963	4.63032	1.73117	4.69590
Sawmills	.45	.26	1.01215	2.85829	.98906	2.48675
Furniture and Fixtures	.42	.31	2.16802	6.12245	1.80821	4.24262
Other Wood Industries	.39	.29	1.83007	5.16820	1.53842	3.63038
Pulp and Paper Mills	.48	.21	1.42941	4.03660	1.48077	4.22944
Paper Products	.33	.22	2.57662	7.27625	2.12043	5.23677
Printing and Publishing	.55	.39	1.78824	5.04995	1.49021	3.54542
Iron and Steel Mills	.50	.20	1.14010	3.21961	1.19857	3.52258
Other Primary Metals	.35	.24	1.44892	4.09168	1.24696	3.01613
Fabricated and Structural Metals	.50	.25	1.68974	4.77191	1.60328	4.39030
Metal Stamping, Pressing and Coating	.35	.20	2.70693	7.64420	2.35728	6.21584
Other Metal Fabricating Industries	.39	.26	2.03767	5.75446	1.73340	4.26384
Miscellaneous Machinery	.47	.24	1.68572	4.76048	1.66287	4.47431
Motor Vehicles and Aircraft	.35	.16	2.01228	5.68267	2.13561	5.78678
Other Transportation Equipment	.36	.23	1.91920	5.41977	1.67158	4.12544
Electrical Appliances	.34	.22	2.69615	7.61393	2.32622	5.86588
Electrical Industrial Equipment	.45	.29	2.17289	6.13610	1.93577	4.71499
Communication Equipment	.40	.26	2.10170	5.93515	1.88898	4.57414
Other Electrical Products	.34	.22	2.07815	5.86861	1.78365	4.37652
Clay, Lime and Cement	.44	.23	1.87065	5.28262	1.81031	4.82229
Other Non-metallic Mineral Products	.43	.28	1.62949	4.60166	1.43705	3.53973
Petroleum Refineries and Coal Products	.14	.04	5.25069	14.82764	7.20026	21.54019
Plastics and Synthetic Resins	.09	.05	7.47293	21.10318	7.05882	19.05000
Paint and Varnish	.32	.19	2.13092	6.01768	1.86499	4.86596
Pharmaceuticals and Medicines	.37	.24	1.66540	4.70866	1.46039	3.67482
Other Chemical Industries	.36	.16	2.16881	6.12462	2.28770	6.38336
Miscellaneous Manufacturing Industries	.37	.28	2.06922	5.84342	1.65540	3.90740
Construction, Maintenance and Repair	.46	.35	2.17768	6.14975	1.80949	4.17481
Transportation, Storage and Trade	.68	.42	.97419	2.75109	.90236	2.22312
Utilities	.66	.18	1.05083	2.96755	1.23019	4.51455
Communications and Other Services	.74	.23	1.26619	3.57563	1.44813	4.84027
Unallocated Sector						

where  $\eta_j$  is the  $j^{\text{th}}$  component of vector  $\mathbf{y}$  and

$$\eta = \sum_{j=1}^n \eta_j.$$

But  $\mathbf{y}$  represents the income vector that could be generated from a dollar increase in the final demands of the respective industries if the economy generated all its direct and indirect output requirements domestically. Since this is not true for Ontario we have to adjust the output requirements to reflect net domestic production. This can easily be done by multiplying system (18) by a diagonal matrix  $\hat{\mathbf{L}}$  whose diagonal entries are the net domestic output per dollar of total supplies. Therefore:

$$\mathbf{Y}_d = \mathbf{h}(\mathbf{I} - \mathbf{A})^{-1} \hat{\mathbf{L}} \quad (19)$$

The symbol  $\mathbf{Y}_d$  refers to the domestic income vector.

Generalizing the procedure adopted by F. T. Moore, we calculate what he refers to as simple income multipliers.<sup>9</sup>

$$\mathbf{m}^y = \mathbf{h}(\mathbf{I} - \mathbf{A})^{-1} \hat{\mathbf{L}} (\hat{\mathbf{H}})^{-1} \quad (20)$$

where  $\hat{\mathbf{H}}$  is a diagonal matrix whose diagonal entries are the respective components of  $\mathbf{h}$ . These multipliers reflect the total increase in Ontario income when the income of a given industry is increased by one dollar.

Similarly we can calculate what we shall refer to as the simple "employment" multipliers:

$$\mathbf{m}^w = \mathbf{w}(\mathbf{I} - \mathbf{A})^{-1} \hat{\mathbf{L}} (\hat{\mathbf{W}})^{-1} \quad (21)$$

where  $\mathbf{w}$  is a row vector of the wage value added per dollar of output and  $\hat{\mathbf{W}}$  is a diagonal matrix whose diagonal entries are the components of the  $\mathbf{w}$  vector.<sup>10</sup>

The above simple income and "employment" multipliers take into account only the income generated by the total production requirements of one dollar's worth of output of sector  $j$ . But as we have already noted earlier the repercussions of the initial change in final demand do not end here. We have therefore constructed another set of multipliers which we shall call induced multipliers.

Let  $\mathbf{Q} = (\mathbf{I} - \mathbf{B})^{-1}$  and  $\bar{\mathbf{Q}}$  be the submatrix of  $\mathbf{Q}$  which is formed by deleting the last column and row of  $\mathbf{Q}$ . Then:

$$\text{and } \begin{aligned} \bar{\mathbf{m}}^y &= \mathbf{h}(\bar{\mathbf{Q}})(\hat{\mathbf{H}})^{-1} \hat{\mathbf{L}} \\ \bar{\mathbf{m}}^w &= \mathbf{w}(\bar{\mathbf{Q}})(\hat{\mathbf{W}})^{-1} \hat{\mathbf{L}} \end{aligned} \quad (22)$$

indicate the vectors of induced income and employment multipliers respectively.

The four sets of multipliers are presented in Table 2 under the appropriate headings. The results of this table indicate that Plastics and Synthetic Resins; Meat and Poultry; Petroleum Refineries and Coal Products and Dairy Products generate respectively the largest simple and induced income multipliers in Ontario. Grain Mills; Other Food Industries; Tobacco and Tobacco Products; Metal Stamping, Pressing and Coating; Electrical Appliances and Knitting Mills also generate significant income multipliers, both simple and induced.

The order and composition of sectors is slightly altered when we consider "employment" multipliers. Petroleum Refineries and Coal Products rank highest; next down the list we have: Plastics; Tobacco; Meat and Poultry and Dairy Products. It is interesting to note that Agriculture which ranks 36th among income multiplier generating industries in Ontario, is however the eighth largest contributing sector to employment generation. Furthermore, the Construction sector which is generally considered to be a high employment and income generating sector does not rank as high as expected. In fact, it ranks slightly above average in generating income multipliers and not as high as the average in generating employment multipliers.

Generally the set of "Food" industries exhibits both large income and employment multipliers, while primary industries such as Mining and Primary Metals have on average both low income and employment multipliers. The results presented above hold equally for simple multipliers and induced multipliers; the basic difference is that of magnitude and, therefore, slight changes in rankings.

We have already mentioned that the entries of Table A1 form a basis for classifying and identifying various sectoral interdependencies. In the next two sections we shall illustrate some of its uses in these reports.

#### IV TYPES OF PRODUCTIVE SECTORS IN ONTARIO

The interdependence among productive sectors can be studied from several points of view. This section is devoted to the analysis of types of productive sectors by grouping

industries according to the pattern of distribution and input sources. We conclude that the characteristics of an industry are in part describable by the proportions of output sold to other industries (for intermediate use) and to final demand; and by the proportion of the ultimate factor of production used to produce a given commodity, that are employed in the sector producing that commodity.

$$\text{Let } \phi_i = \frac{\text{total sales of intermediate product by industry } i}{\text{total output of industry } i}$$

A large  $\phi_i$  means that industry  $i$  is an important supplier of materials and finished goods rather than a supplier of consumer goods.

Actually,

$$\phi_i = \sum_{j=1}^n a_{ij} = \sum_{j=1}^n \beta_{ij} = a_{i.}$$

Similarly, let  $\lambda_j$  denote the proportion of inputs purchased from other industries by industry  $j$ :

$$\lambda_j = \frac{\text{total purchases of intermediate inputs by industry } j}{\text{total output of industry } j}$$

Or,

$$\lambda_j = \sum_{i=1}^n a_{ij} = \sum_{i=1}^n \beta_{ij} = a_{.j}$$

A large  $\lambda_j$  means that a large proportion of industry  $j$ 's output is made up of intermediate products acquired from other producing industries.<sup>11</sup>

For the economy as a whole, the extent of indirect factor use and the extent of intermediate demand are the same if we make allowance for foreign trade. The ratio of intermediate use to total production of .610 constitutes a weighted average of either the  $\phi$ 's or the  $\lambda$ 's:

$$.610 = \frac{\sum_{i=1}^n \phi_i}{n} = \frac{\sum_{j=1}^n \lambda_j}{n}$$

However, there exists no necessary correlation between the two measures for any single sector.

In as much as the study of sectoral relatedness involves the relation of sectors on both the demand and supply sides

<sup>9</sup>F. T. Moore, "Regional Economic Reaction Paths", American Economic Review, (May, 1955), pp. 133-148.

<sup>10</sup>For convenience's sake we measure labour not in man-years but in terms of the total wages

and salaries. The relationship between salaries and wages and that of man-years is straight forward and one can therefore use these terms interchangeably.

<sup>11</sup>For a detailed coverage of these points and as

a possible reference to other countries' coefficients see H. B. Chenery and T. Watanabe, "International Comparisons of The Structure of Production", Econometrica, (October, 1955), pp. 487-521.



Table 3 – Types of Productive Sectors

Output	Final (Low Ø)			Intermediate (High Ø)				
Manufacturing (High λ)	I – Final Manufacture			II – Intermediate Manufacture				
		λ	Ø		λ	Ø		
	33	Electrical Appliances	.655	.033	14	Cotton Yarn and Cloth	.641	.672
	42	Pharmaceuticals and Medicines	.625	.060	8	Other Food Industries	.770	.727
	16	Knitting Mills	.647	.073	29	Other Metal Fabricating Industries	.615	.784
	11	Tobacco and Tobacco Products	.735	.145	15	Synthetic Textiles	.620	.833
	36	Other Electrical Products	.663	.162	23	Paper Products	.674	.854
	41	Paint and Varnish	.676	.178	26	Other Primary Metals	.650	1.434
	32	Other Transportation Equipment	.643	.184	43	Other Chemical Industries	.645	1.811
	40	Plastics and Synthetic Resins	.906	.594	49	Unallocated Sector	.998	3.150
	13	Leather and Leather Products	.651	.228				
	4	Dairy Products	.814	.270				
	31	Motor Vehicles and Aircraft	.649	.372				
	28	Metal Stamping, Pressing and Coating	.651	.283				
	5	Grain Mills	.812	.380				
	39	Petroleum Refineries and Coal Products	.864	.400				
	7	Sugar and Confectioneries	.626	.414				
44	Miscellaneous Manufacturing Industries	.631	.419					
3	Meat and Poultry	.860	.528					
Primary production (Low λ)	III – Final Primary Production			IV – Intermediate Primary Production				
		λ	Ø		λ	Ø		
	6	Biscuits and Bakeries	.604	.008	22	Pulp and Paper Mills	.523	.657
	9	Soft Drinks	.529	.009	18	Other Textile Mills	.607	.713
	20	Furniture and Fixtures	.577	.045	2	Mining	.426	1.04
	17	Clothing Industries	.570	.045	48	Communications and Other Services	.264	1.96
	30	Miscellaneous Machinery	.528	.045	1	Agriculture, Forestry and Fishing	.474	2.06
	10	Distilleries, Breweries and Wineries	.405	.049	25	Iron and Steel Mills	.502	2.10
	27	Fabricated and Structural Metals	.500	.100	46	Transportation, Storage and Trade	.316	2.60
	34	Electrical Industrial Equipment	.554	.103				
	35	Communication Equipment	.602	.259				
	12	Rubber Products	.592	.267				
	37	Clay, Lime and Cement	.557	.270				
	24	Printing and Publishing	.455	.327				
	45	Construction, Maintenance and Repair	.541	.354				
	38	Other Non-metallic Mineral Products	.571	.430				
	19	Sawmills	.546	.576				
	47	Utilities	.336	.596				
	21	Other Wood Industries	.607	.315				

begin by classifying sectors according to these two measures. Specifically, we will use a simple two-way classification for each sector, based on whether the values of  $\phi$ 's are below or above their mean values. These are shown in Table 3 for each industry and their distribution in Table 4. The value of these coefficients depends

on the classification used, a greater degree of disaggregation would sharpen the distinction between final and intermediate on the one hand, and between manufacturing and primary on the other hand. Despite the blurring due to aggregation, the distinction between manufacturing and primary, and between final and intermediate is sufficiently

clear and few sectors, as Table 4 reveals, are close to their mean values.

The present system of classifications attempts to focus on the different roles played by various sectors in the total process of production. Those sectors that fall under Final Primary are relatively independent of other producers and provide a direct link

Table 4 — The Distribution of  $\emptyset_i$  and  $\lambda_j$ [illegible]



the final users and the owners of primary factors. Those in category II – Intermediate Manufacture are at the other extreme. The cost of their use of primary factors of production is less than the cost of purchased inputs, and more than 60 percent of their output goes to other producers.<sup>12</sup>

It is worth noting that industries with large multipliers and large induced and indirect effects fall under Final Manufacture, and industries with low multipliers and small effects fall under Final Primary.

Some economists have gone as far as describing a pattern of production over time. One rough way they maintain that categories II, I may be thought of as successive stages of production.<sup>13</sup>

It is indeed true that sectors under category I represent a list of “mature” sectors, and whether one can discern a historical pattern of sectors maturing from stage III into stage I remains an open question and is beyond the scope of this paper.

The distinctions which we have drawn so far neglect the fact that inter-sectoral transactions may involve either one or many other sectors and that the resulting patterns of dependence might, at least *a priori*, take an infinite variety of forms. In particular the coefficients used only reflect direct relationships, but we have already pointed out that an industry with little or no direct influence on the system may generate significant influence through its indirect effects and/or induced effects. In the subsequent section we turn to the use of direct and indirect effects measured by their measures of dispersion as a means of identifying key sectors.

## THE KEY SECTORS IN THE ECONOMY OF ONTARIO

Averages of the total input requirements for a unit increase in the final demand for each sector

$$\frac{1}{n} \sum_{i=1}^n c_{ij} = \frac{1}{n} c_{.j} \quad (j = 1, \dots, n) \quad (26)$$

interpreted by Rasmussen “. . . as an estimate of the direct and indirect increase in output to be supplied by an industry when at random if the final demand for the products of industry  $j$  ( $j = 1, \dots, n$ ) increases by one unit.”<sup>14</sup>

A similar interpretation has been suggested by Rasmussen regarding the set of averages:

$$\frac{1}{n} \sum_{j=1}^n c_{ij} = \frac{1}{n} c_{i.} \quad (i = 1, \dots, n) \quad (27)$$

These sets in their present form are not suitable for making intersectoral comparisons and for this purpose the set of averages are normalized by the overall average defined as:

$$\frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n c_{ij} = \frac{1}{n^2} \sum_j c_{.j} = \frac{1}{n^2} \sum_i c_{i.} \quad (28)$$

Let us then consider the following indices:

$$U_j = \frac{1}{n} c_{.j} / \frac{1}{n^2} \sum_j c_{.j} \quad (29)$$

and

$$U_i = \frac{1}{n} c_{i.} / \frac{1}{n^2} \sum_i c_{i.} \quad (30)$$

$U_j$  and  $U_i$  were interpreted by Rasmussen as the “Index of Power of Dispersion and the Index and Sensitivity of Dispersion”. Recently Hazari<sup>15</sup> interpreted them as measures of Hirschman’s backward and forward linkages.

Since the average

$$\bar{U} = \sum_{j=1}^n U_j / n = \sum_{i=1}^n U_i / n = 1 \quad (31)$$

it implies for any sector  $i$  with  $U_i > 1$ , that its output will have to increase more than others for a unit increase in the final demand of the whole system. Similarly, for any sector  $j$  with  $U_j > 1$ , it implies that sector  $j$  absorbs more than the average of the whole system of outputs of other sectors, and vice versa, if  $U_j < 1$ . Hazari justifiably notes that the indices in (29) and (30) are based on the method of averaging and therefore influenced by extreme values and may give misleading results.<sup>16</sup> He also devised two other indices to be used in conjunction with  $U_i$  and  $U_j$ . These are shown in equations (32) and (33).

A high  $V_j$  may be interpreted as indicating that a particular industry draws heavily on one or a few sectors and a low  $V_j$  as a sector drawing evenly from other sectors. Similarly one can interpret the  $V_i$ ’s in the same way.

Adopting Hazari’s criterion, a key sector is one which has:

(a) both  $U_i$  and  $U_j$  greater than  $\bar{U}$  or ( $U_j > 1$  and  $U_i > 1$ ),

and

(b) both  $V_i$  and  $V_j$  are low relative to their averages.

This definition of key sectors can again be identified with Hirschman’s definition of a key sector as one with high forward and backward links. Hirschman’s definition, however, does not impose any restrictions on variability.<sup>17</sup>

In Table 5 and Table 6 we present a two-way classification of  $U_j$  and  $V_j$  and their

$$V_j = \left[ \left( \frac{1}{n-1} \right) \left[ \sum_{i=1}^n (c_{ij} - \frac{1}{n} c_{.j})^2 \right] \right]^{1/2} / \frac{1}{n} c_{.j} \quad (32)$$

for all ( $j = 1, \dots, n$ )

which is equivalent to the standard deviation of the  $\sum_{i=1}^n c_{ij}$  divided by their average. This is known as the coefficient of variation index.

Similarly,

$$V_i = \left[ \left( \frac{1}{n-1} \right) \left[ \sum_{j=1}^n (c_{ij} - \frac{1}{n} c_{i.})^2 \right] \right]^{1/2} / \frac{1}{n} c_{i.} \quad (33)$$

for all ( $i = 1, \dots, n$ )

*Energy and Watanabe, Ibid., pp. 493-497.*  
cit., p. 494.

regard P. Rasmussen, *Studies in Intersectoral Relations*, (Amsterdam: North-Holland Publishing Co., 1952), p. 133.

<sup>15</sup>Bharat R. Hazari, *Empirical Identification of Key Sectors In The Indian Economy*, *Review of Economics and Statistics* (May, 1970), pp. 301-305.  
<sup>16</sup>B. R. Hazari, *Ibid.*, p. 302.

<sup>17</sup>A. O. Hirschman, *The Strategy of Economic Development*, (New Haven: Yale University Press, 1958).

Table 5 – Backward Linkages and Their Coefficients of Variation

<div><div><div><math>U_j</math></div><div><math>V_j</math></div></div></div>	Low $U_j$	High $U_j$
Low $V_j$	<div><div><div>I – Sectors with Low Backward Linkage and Low Coefficient of Variation</div><div><div><div><math>V_j</math></div><div><math>U_j</math></div></div><div><div><div>9 Soft Drinks</div><div>3.04</div><div>.96</div></div><div><div>17 Clothing Industries</div><div>3.15</div><div>.97</div></div><div><div>20 Furniture and Fixtures</div><div>3.08</div><div>.96</div></div><div><div>28 Metal Stamping, Pressing and Coating</div><div>3.23</div><div>.99</div></div><div><div>29 Other Metal Fabricating Industries</div><div>3.35</div><div>.99</div></div><div><div>30 Miscellaneous Machinery</div><div>3.40</div><div>.89</div></div><div><div>34 Electrical Industrial Equipment</div><div>3.15</div><div>.95</div></div><div><div>45 Construction, Maintenance and Repair</div><div>3.30</div><div>.89</div></div></div></div></div></div>	<div><div><div>II – Sectors with High Backward Linkage and Low Coefficient of Variation</div><div><div><math>V_j</math></div></div><div><div><div>3 Meat and Poultry</div><div>3.35</div></div><div><div>4 Dairy Products</div><div>3.29</div></div><div><div>5 Grain Mills</div><div>2.94</div></div><div><div>6 Biscuits and Bakeries</div><div>2.79</div></div><div><div>8 Other Food Industries</div><div>3.00</div></div><div><div>11 Tobacco and Tobacco Products</div><div>3.32</div></div><div><div>12 Rubber Products</div><div>3.25</div></div><div><div>13 Leather and Leather Products</div><div>3.25</div></div><div><div>15 Synthetic Textiles</div><div>3.30</div></div><div><div>16 Knitting Mills</div><div>3.00</div></div><div><div>23 Paper Products</div><div>3.50</div></div><div><div>32 Other Transportation Equipment</div><div>3.45</div></div><div><div>33 Electrical Appliances</div><div>2.95</div></div><div><div>35 Communication Equipment</div><div>3.43</div></div><div><div>36 Other Electrical Products</div><div>2.86</div></div><div><div>39 Petroleum Refineries and Coal Products</div><div>3.25</div></div><div><div>40 Plastics and Synthetic Resins</div><div>2.89</div></div><div><div>41 Paint and Varnish</div><div>2.90</div></div><div><div>42 Pharmaceuticals and Medicines</div><div>3.00</div></div><div><div>43 Other Chemical Industries</div><div>3.40</div></div><div><div>44 Miscellaneous Manufacturing Industries</div><div>3.00</div></div><div><div>49 Unallocated Sector</div><div>2.90</div></div></div></div></div>
	<div><div><div>III – Sectors with Low Backward Linkage and High Coefficient of Variation</div><div><div><div><math>V_j</math></div><div><math>U_j</math></div></div><div><div><div>1 Agriculture, Forestry and Fishing</div><div>3.76</div><div>.86</div></div><div><div>2 Mining</div><div>3.87</div><div>.81</div></div><div><div>10 Distilleries, Breweries and Wineries</div><div>3.63</div><div>.82</div></div><div><div>19 Sawmills</div><div>4.59</div><div>.90</div></div><div><div>21 Other Wood Industries</div><div>3.54</div><div>.95</div></div><div><div>22 Pulp and Paper Mills</div><div>4.45</div><div>.87</div></div><div><div>24 Printing and Publishing</div><div>3.83</div><div>.83</div></div><div><div>25 Iron and Steel Mills</div><div>4.16</div><div>.86</div></div><div><div>27 Fabricated and Structural Metals</div><div>3.65</div><div>.85</div></div><div><div>37 Clay, Lime and Cement</div><div>3.69</div><div>.91</div></div><div><div>38 Other Non-metallic Mineral Products</div><div>3.71</div><div>.95</div></div><div><div>46 Transportation, Storage and Trade</div><div>4.67</div><div>.69</div></div><div><div>47 Utilities</div><div>5.28</div><div>.66</div></div><div><div>48 Unallocated Sector</div><div>5.01</div><div>.65</div></div></div></div></div></div>	<div><div><div>IV – Sectors with High Backward Linkage and High Coefficient of Variation</div><div><div><math>V_j</math></div></div><div><div><div>7 Sugar and Confectioneries</div><div>3.71</div></div><div><div>14 Cotton Yarn and Cloth</div><div>3.92</div></div><div><div>18 Other Textile Mills</div><div>3.57</div></div><div><div>26 Other Primary Metals</div><div>4.19</div></div><div><div>31 Motor Vehicles and Aircraft</div><div>3.85</div></div></div></div></div>



e 6 – The Distribution of  $U_j$  and  $V_j$ 

$V_j$	$U_j$
2.78947	
2.85507	
2.88778	
2.90236	
2.90565	
2.94291	
2.94746	
2.96318	
2.97444	
2.99533	
3.00134	
3.04429	
3.08306	
3.15161	
3.15471	
3.23519	
3.24996	
3.25451	
3.25550	
3.28629	
3.29775	
3.30469	
3.31852	
3.35071	
3.35337	
3.39771	
3.40561	
3.42837	
3.45020	
3.49600	
3.54460	
3.56871	
3.62978	
3.64817	
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3.76434	
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3.85188	
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Table 7 — Forward Linkages and Their Coefficients of Variation

<div><div>U<sub>i</sub></div><div>V<sub>i</sub></div></div>	Low U <sub>i</sub>	High U <sub>i</sub>																																																																																	
Low V <sub>i</sub>	<div>I – Sectors with Low Forward Linkage and Low Coefficient of Variation</div> <table><thead><tr><th></th><th>V<sub>i</sub></th><th>U<sub>i</sub></th></tr></thead><tbody><tr><td>3 Meat and Poultry</td><td>4.30</td><td>.87</td></tr><tr><td>5 Grain Mills</td><td>4.17</td><td>.77</td></tr><tr><td>8 Other Food Industries</td><td>3.60</td><td>.97</td></tr><tr><td>18 Other Textile Mills</td><td>3.90</td><td>.94</td></tr><tr><td>28 Metal Stamping, Pressing and Coating</td><td>4.37</td><td>.65</td></tr><tr><td>39 Petroleum Refineries and Coal Products</td><td>3.25</td><td>.96</td></tr><tr><td>40 Plastics and Synthetic Resins</td><td>3.78</td><td>.84</td></tr><tr><td>44 Miscellaneous Manufacturing Industries</td><td>3.90</td><td>.81</td></tr><tr><td>45 Construction, Maintenance and Repair</td><td>2.96</td><td>.96</td></tr></tbody></table>		V <sub>i</sub>	U <sub>i</sub>	3 Meat and Poultry	4.30	.87	5 Grain Mills	4.17	.77	8 Other Food Industries	3.60	.97	18 Other Textile Mills	3.90	.94	28 Metal Stamping, Pressing and Coating	4.37	.65	39 Petroleum Refineries and Coal Products	3.25	.96	40 Plastics and Synthetic Resins	3.78	.84	44 Miscellaneous Manufacturing Industries	3.90	.81	45 Construction, Maintenance and Repair	2.96	.96	<div>II – Sectors with High Forward Linkage and Low Coefficient of Variation</div> <table><thead><tr><th></th><th>V<sub>i</sub></th></tr></thead><tbody><tr><td>1 Agriculture, Forestry and Fishing</td><td>2.22</td></tr><tr><td>2 Mining</td><td>2.25</td></tr><tr><td>15 Synthetic Textiles</td><td>3.43</td></tr><tr><td>22 Pulp and Paper Mills</td><td>3.51</td></tr><tr><td>23 Paper Products</td><td>3.14</td></tr><tr><td>24 Printing and Publishing</td><td>2.75</td></tr><tr><td>25 Iron and Steel Mills</td><td>2.00</td></tr><tr><td>26 Other Primary Metals</td><td>2.50</td></tr><tr><td>29 Other Metal Fabricating Industries</td><td>2.34</td></tr><tr><td>43 Other Chemical Industries</td><td>1.90</td></tr><tr><td>46 Transportation, Storage and Trade</td><td>.84</td></tr><tr><td>47 Utilities</td><td>3.18</td></tr><tr><td>48 Communications and Other Services</td><td>.97</td></tr><tr><td>49 Unallocated Sector</td><td>.87</td></tr></tbody></table>		V <sub>i</sub>	1 Agriculture, Forestry and Fishing	2.22	2 Mining	2.25	15 Synthetic Textiles	3.43	22 Pulp and Paper Mills	3.51	23 Paper Products	3.14	24 Printing and Publishing	2.75	25 Iron and Steel Mills	2.00	26 Other Primary Metals	2.50	29 Other Metal Fabricating Industries	2.34	43 Other Chemical Industries	1.90	46 Transportation, Storage and Trade	.84	47 Utilities	3.18	48 Communications and Other Services	.97	49 Unallocated Sector	.87																					
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Table 9 — Key Sectors in the Ontario Economy

Sector	$U_j$	$U_i$	$V_j$	$V_i$
Synthetic Textiles	1.04	1.02	3.30	3.43
Transportation, Storage and Trade	1.06	2.29	3.40	1.90
Paper Products	1.07	1.14	3.50	3.14
Other Chemical Industries	1.06	2.29	3.40	1.89

Table 10 — Potential Key Sectors in the Ontario Economy

Sector	$U_j$	$U_i$	$V_j$	$V_i$
Other Metal Fabricating Industries	.99	1.34	3.35	2.34
Other Food Industries	1.20	.97	2.99	3.60
Other Primary Metals	1.04	1.79	4.18	2.50
Plastics and Synthetic Resins	1.40	.84	2.88	3.77
Dairy Products	1.26	.87	3.35	4.30
Miscellaneous Manufacturing Industries	1.08	.81	3.00	3.90

respective distributions. Obviously the sectors that fall under high  $U_j$  and low  $V_j$  such as Meat and Poultry; Dairy Products; Plastics and Synthetic Resins reveal a high absorption rate from a large number of sectors of the economy. It should be emphasized again that these very same sectors appeared in "favourable" positions with respect to other criteria of classification.

Similarly sectors with high  $U_i$  and low  $V_i$  can be identified from Table 7 and Table 8. Communications; Other Chemical Industries; Iron and Steel; Agriculture and Mining seem to be the prominent sectors according to this classification that refers to above average supply of direct and indirect output to a large number of other sectors.

The sectors that possess both high  $U_i$  and low  $V_i$ , and high  $U_j$  and low  $V_j$  are the key sectors. Surprisingly only four sectors qualify in Ontario and these are sectors that did not rank high under the other criteria used.

Other sectors may qualify were we to relax the strict conditions (a) and (b). Table 10 shows those possible candidates that may have qualified as key sectors but did not because of slight violation of one of the conditions in (a) and (b) while ranking better than average on the rest.

The least prominent sectors according to this criterion and those exhibiting structural and linkage weaknesses are Soft Drinks; Distilleries, Breweries and Wineries; Sugar and Confectioneries; Cotton, Yarn and Cloth; Clothing Industries; Sawmills; Furniture and Fixtures; Other Wood Industries; Fabricated and Structural Metals; Miscellaneous Machinery; Electrical Industrial Equipment; Clay, Lime and Cement; Other Non-Metallic Mineral Products.

## VI SECTORAL MARKET DEPENDENCIES

Structural and linkage weaknesses may however be the result of the structure of trade in the economy. It is therefore important to analyse the contribution of the different categories of final demand to the generation of a demand for each individual sector. This necessitated the construction of a final demand matrix  $F$  whose typical element  $f_{ij}$  represents output of sector  $i$  destined to final demand category  $j$ . The percentage contribution of the different types of final demand to the generation of demand for each productive sector is described in Table 11 using indices computed from the following system:

$$D = (\hat{X})^{-1} (I - A)^{-1} F$$

where  $\hat{X}$  is a diagonal matrix whose diagonal entries are the elements of the output vector  $x$ . The typical element  $d_{ij}$  of matrix  $D$  represents the percentage contribution of sector  $j$  to the generation of demand for the output of sector  $i$ . For instance  $d_{11}$  shows that 65 per cent of the output of the Agricultural sector is generated by household demand, while  $d_{12}$  shows that investment accounts for only three per cent of the sector's output.

The magnitudes and signs of these entries are instructive and illuminating. For instance under the last category, Trade Balance and Other Final Demand, a negative sign indicates a net import position, a large positive magnitude may indicate a net export position. This table may serve as a practical guide in searching for optimal industries to attract and develop in Ontario. For instance, if a sector is a net importer we may be interested in attracting new industries or encouraging already existing industries to export in order to substitute their output for the sector's imports. However, these decisions cannot be made without a thorough review of the sector's standing in the provincial economy. This paper is devoted primarily to the task of assessing the standing of each sector. We have already classified sectors according to more than one criterion. We are thus in a position now to synthesize and consolidate our results.

## VII SUMMARY AND CONCLUDING REMARKS

The large number of criteria used to classify and assess sectoral links and standing in the economy clearly reveal that "fundamental" sectors can neither be defined nor identified uniquely. However, it is only practical that we try to synthesize and consolidate our results in a meaningful way that can be used by planners or researchers independently of their different objectives. Table 11 is construed to present this synthesis; sectors are rated plus when they score above or equal to the average score under that criterion and minus when they score below average. Also the pluses are identified with positive utility in the sense that low  $V_j$ 's (below average  $V_j$ ) are associated with pluses and above average  $V_j$ 's with minuses. This is also true for the  $V_i$ , imports and exports. Above average importation rates by a given sector



Table 11 – Percentage Dependence of Sectoral Output on Various Categories of Final Demand

Industry	Final Demand Category		Changes in Inventories, Finished Goods and Goods in Process	Changes in Inventories, Raw Materials	Provincial Government Expenditures	Municipal Government Expenditures	Trade Balance and Other Final Demand
	Personal Consumption Expenditures	Investment					
Agriculture, Forestry and Fishing	.645517862	.027881095	.004178986	.003315477	.007794353	.012051727	.299283519
Mining	.517351465	.153708860	.026440816	.023426429	.023694807	.065307064	.190033979
Meat and Poultry	1.109476697	.018645238	-.000217012	.002944497	.007581281	.012383820	-.150788928
Dairy Products	.536954592	.013869348	.003133031	.001902875	.007857326	.010662589	.425654523
Grain Mills	1.030694992	.023415288	.004283057	.004256565	.007536309	.011353334	-.081692321
Biscuits and Bakeries	.709659657	.011916574	.000627454	.001167449	.006202196	.010313712	.260042990
Sugar and Confectioneries	1.287150681	.010521782	.009954987	.005684116	.006136430	.008469624	-.327964175
Other Food Industries	.783936506	.015307740	.012288333	.003563951	.005056575	.009865669	.169942764
Soft Drinks	.991717842	.019418638	.007409333	.002302431	.006715881	.015493094	-.043241725
Distilleries, Breweries and Wineries	.501523500	.014943913	.006205419	.001909337	.001654467	.004024777	.469664132
Tobacco and Tobacco Products	.312452997	0.000000000	-.002474674	-.000325437	.000677993	.001098348	.688569521
Rubber Products	.349699251	.081000681	.004707449	.006915164	.007018597	.016193974	.534503416
Leather and Leather Products	.680363986	.016204442	-.005991926	.005628836	.001621746	.004331610	.297866592
Cotton Yarn and Cloth	3.337612181	.154426105	.019328704	.049079435	.019159222	.049301502	-2.628179480
Synthetic Textiles	1.173385791	.092523710	.017262843	.018203032	.007311021	.015787012	-.324377553
Knitting Mills	.664167895	.001189601	.002663560	.001142308	.000420877	.001757613	.328813903
Clothing Industries	1.816299928	.008135485	.002538323	.000892440	.002281010	.017446169	-.847485658
Other Textile Mills	.819361743	.088881019	.008857235	.011153546	.008659588	.014405230	.048647474
Sawmills	.757319522	.970708479	.022615903	.037245065	.047289592	.283790985	-1.118761645
Furniture and Fixtures	.548864036	.148068854	.002905826	.001398603	.003861143	.001161665	.293789528
Other Wood Industries	.392198449	.468618126	.016778138	.013096556	.028956274	.048032386	.032295580
Pulp and Paper Mills	.340566093	.065556220	.005172327	.006574985	.006026741	.014682678	.561464269
Paper Products	.563952490	.128611701	.014674000	.012188416	.011690978	.029266885	.239626293
Printing and Publishing	.540347079	.102205381	.012656687	.014335008	.014245131	.042042094	.274156322
Iron and Steel Mills	.383890325	.284077471	.053668962	.065897363	.017392671	.048247250	.146828232
Other Primary Metals	.504894570	.425348577	.026356951	.046109790	.018654167	.091586960	-.112946300
Fabricated and Structural Metals	.156889994	.260470801	.020199950	.006822086	.062974891	.222765906	.269976215
Metal Stamping, Pressing and Coating	.251172109	.089367947	.009208139	.005515212	.013592462	.012827719	.618312603
Other Metal Fabricating Industries	.267523529	.338050038	.023716622	.009322302	.016453310	.045862435	.299069494
Miscellaneous Machinery	.107142251	.245363153	.012602109	.002653985	.002726664	.003950154	.625584041
Motor Vehicles and Aircraft	.453387730	.096386072	.010143810	.004988684	.001410531	.004312216	.429379277
Other Transportation Equipment	.456941664	.386380747	.013395052	.009230805	.005195046	.014592742	.114323050
Electrical Appliances	.305395769	.036362159	.010297094	.000899577	.001132150	.002513064	.643457840
Electrical Industrial Equipment	.082213765	.181488956	.004299699	.000930216	.003273697	.003217203	.724596601
Communication Equipment	.194995525	.188770581	.015488387	.004022782	.005499264	.013973084	.576727568
Other Electrical Products	.298165623	.309482673	.016352075	.007347928	.011184695	.017007510	.340488334
Clay, Lime and Cement	.237564494	.376694981	.011670251	.010783766	.030365914	.174641499	.158351834
Other Non-metallic Mineral Products	.508119569	.184425618	.011688982	.008918509	.010496892	.025489446	.250774532
Petroleum Refineries and Coal Products	.882485994	.129233614	.008979037	.008967088	.023858505	.064030499	-.117586229
Plastics and Synthetic Resins	.584538984	.155773891	.014598745	.017290491	.010319302	.023083298	.194350699
Paint and Varnish	.590004430	.206594646	.017633007	.015285911	.019321337	.038083277	.113010981
Pharmaceuticals and Medicines	.901247060	.019935280	.002273786	.002885205	.014948838	.011790869	.046578875
Other Chemical Industries	.508790465	.084964755	.013967824	.011936524	.011266466	.027276488	.341791871
Miscellaneous Manufacturing Industries	.506425810	.152572277	.016928340	.009961208	.008389436	.019358651	.287152304
Construction, Maintenance and Repair	.202579364	.553072804	.001596927	.002294540	.023729540	.028368494	.188364110
Transportation, Storage and Trade Utilities	1.063266498	.255880984	.016635114	.012492187	.034812705	.053927224	-.437020950
Communications and Other Services	1.205870490	.123313731	.012030777	.017926838	.015491787	.170493447	-.545098323
Unallocated Sector	.898810549	.066960848	.003545802	.005478464	.011943643	.063130622	-.049873546
	.733809013	.170154223	.014670782	.023934711	.017420686	.045418740	-.005414546

Table 12 – Summary of Results

Industry No.	Industry	Direct Output Effect	Indirect Output Effect	Induced Output Effect	Simple Income Multiplier	Simple Employment Multiplier	Backward Linkage $U_j$	Backward Linkage $V_j$	Forward Linkage $U_i$	Forward Linkage $V_i$	Production Type
1	Agriculture, Forestry and Fishing	—	—	+	—	+	—	—	+	+	IP
2	Mining	—	—	—	—	—	—	—	+	+	IP
3	Meat and Poultry	+	+	+	+	+	+	+	—	+	FM
4	Dairy Products	+	+	—	+	+	+	+	—	—	FM
5	Grain Mills	+	+	—	+	+	+	+	—	+	FM
6	Biscuits and Bakeries	—	+	—	+	—	+	+	—	—	FP
7	Sugar and Confectioneries	+	+	—	—	—	+	—	—	—	FM
8	Other Food Industries	+	+	+	+	+	+	+	—	+	IM
9	Soft Drinks	—	—	—	—	—	—	+	—	—	FP
10	Distilleries, Breweries and Wineries	—	—	—	—	—	—	—	—	—	FP
11	Tobacco and Tobacco Products	+	+	—	+	+	+	+	—	—	FM
12	Rubber Products	—	+	—	+	+	+	+	—	—	FP
13	Leather and Leather Products	+	+	—	—	—	+	+	—	—	FM
14	Cotton Yarn and Cloth	+	+	—	—	—	+	—	—	—	IM
15	Synthetic Textiles	+	+	—	—	—	+	+	+	+	IM
16	Knitting Mills	+	+	—	+	+	+	+	—	—	FM
17	Clothing Industries	—	—	—	—	—	—	+	—	—	FP
18	Other Textile Mills	—	+	—	—	—	+	—	—	+	IP
19	Sawmills	—	—	—	—	—	—	—	—	—	IP
20	Furniture and Fixtures	—	—	—	+	—	—	+	—	—	IP
21	Other Wood Industries	—	—	—	—	—	—	—	—	—	FP
22	Pulp and Paper Mills	—	—	—	—	—	—	—	+	+	IP
23	Paper Products	+	+	—	+	+	+	+	+	+	IM
24	Printing and Publishing	—	—	—	—	—	—	—	+	+	FP
25	Iron and Steel Mills	—	—	—	—	—	—	—	+	+	IP
26	Other Primary Metals	+	+	—	—	—	+	—	+	+	IM
27	Fabricated and Structural Metals	—	—	—	—	—	—	—	—	—	FP
28	Metal Stamping, Pressing and Coating	+	—	—	+	+	—	+	—	+	FM
29	Other Metal Fabricating Industries	+	—	—	—	—	—	+	+	+	IM
30	Miscellaneous Machinery	—	—	—	—	—	—	—	—	—	FP
31	Motor Vehicles and Aircraft	+	+	+	—	+	+	—	—	—	FM
32	Other Transportation Equipment	+	+	—	—	—	+	+	—	—	FM
33	Electrical Appliances	+	+	—	+	—	+	+	—	—	FM
34	Electrical Industrial Equipment	—	—	—	+	+	—	+	—	—	FP
35	Communication Equipment	—	+	—	+	—	+	+	—	—	FP
36	Other Electrical Products	+	+	—	—	—	+	+	—	—	FM
37	Clay, Lime and Cement	—	—	—	—	+	—	—	—	—	FP
38	Other Non-metallic Mineral Products	—	—	—	—	—	—	—	—	—	FP
39	Petroleum Refineries and Coal Products	+	+	+	+	+	+	+	—	+	FM
40	Plastics and Synthetic Resins	+	+	—	+	+	+	+	—	+	FM
41	Paint and Varnish	+	+	—	—	—	+	+	—	—	FM
42	Pharmaceuticals and Medicines	+	+	—	—	—	+	+	—	—	FM
43	Other Chemical Industries	+	+	+	+	+	+	+	+	+	IM
44	Miscellaneous Manufacturing Industries	+	+	—	—	—	+	+	—	+	FM
45	Construction, Maintenance and Repair	—	—	+	+	—	—	+	—	+	FP
46	Transportation, Storage and Trade	—	—	+	—	—	—	—	+	+	IP
47	Utilities	—	—	+	—	—	—	—	+	+	FP
48	Communications and Other Services	—	—	+	—	—	—	—	+	+	IP
49	Unallocated Sector	+	+	+	?	?	+	+	+	+	IM



d minus, and plus for below average rates. Similarly, above average exports are rated plus, and below average exports minus.

A striking result of Table 12 is the absence of consistent sectoral ratings. Indeed, very few sectors rank consistently positive or negative under most criteria. Accordingly, no general conclusions can be made concerning the relative standing and contribution of any individual sector or group of sectors without consideration of specific restrictions imposed by the nature of the problem and the objectives of policy makers. However, once the nature of the problem and the objectives are clearly defined, our results could prove useful in assessing the relative contribution of these sectors to the economy at large.

In general, however, the following results may be deduced from the findings reported in the tables:

1. Sectors with a net export position have generally limited forward and backward linkages with the rest of the economy, while sectors showing strong and viable linkages are on average net importers. (This suggests, that Ontario's structure of trade is perhaps sub-optimal, i.e., in the sense that different arrangements may lead to improved domestic sectoral communications and interactions.)
2. The appreciable variation of multipliers suggests that the aggregate assessment and planning of government expenditures and programs should be supplemented by a microsectoral assessment. Furthermore,

contemplated increases in government expenditures should be directed to specific industries with high income and employment effects.

3. Finally, several sectors show insensitivity to induced changes in final demands. Moreover, the induced effects are on average smaller than anticipated relative to other output effects.

This paper represents an initial attempt at assessing the economic contribution and ranking of the individual sectors of the Ontario economy subject to specified restrictions. Although the sectors are highly aggregated these preliminary results will provide a basis for a more detailed analysis of the complex industrial structure of the provincial economy.

# Appendix

**Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand**

Industry No.		Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Bakeries
	Industry	1	2	3	4	5	6
1	Agriculture, Forestry and Fishing	.06656 1.06193 .16051	0.00000 .00941 .16051	.49733 .24086 .16051	.44577 .19484 .16052	.33965 .14688 .16051	.00000 .14688 .16051
2	Mining	.00130 .04997 .06259	.05410 1.02647 .06260	.00111 .04033 .06259	.00158 .04013 .06260	.00649 .03514 .06259	.00000 .02647 .06259
3	Meat and Poultry	.00081 .01236 .10363	0.00000 .00494 .10363	.21956 1.07507 .10363	.00906 .01570 .10364	.04984 .03408 .10364	.01956 .03408 .10364
4	Dairy Products	0.00000 .00284 .03709	0.00000 .00222 .03710	.00369 .00546 .03709	.19276 1.05029 .03709	.00466 .00665 .03709	.01363 .01570 .03709
5	Grain Mills	.09149 .01956 .04436	.00000 .00168 .04436	.00036 .07542 .04436	0.00000 .06412 .04435	.05784 1.05796 .04435	.14688 .03408 .04435
6	Biscuits and Bakeries	0.00000 .00082 .02395	0.00000 .00097 .02396	0.00000 .00088 .02396	.00008 .00102 .02396	0.00000 .00101 .02396	0.00000 1.00000 .02396
7	Sugar and Confectioneries	.00020 .00233 .02708	0.00000 .00056 .02708	.00028 .00310 .02708	.01816 .01414 .02708	.00969 .00815 .02708	.00000 .01414 .02708
8	Other Food Industries	.00266 .01668 .09097	0.00000 .00552 .09098	.02816 .02997 .09098	.00682 .01862 .09097	.08295 .03806 .09097	.14688 .03408 .09097
9	Soft Drinks	0.00000 .00054 .01173	0.00000 .00068 .01174	0.00000 .00058 .01174	0.00000 .00063 .01174	0.00000 .00071 .01173	0.00000 .00071 .01173
10	Distilleries, Breweries and Wineries	0.00000 .00131 .02111	0.00000 .00180 .02111	0.00000 .00159 .02111	0.00000 .00179 .02111	.00004 .00201 .02111	0.00000 .00201 .02111
11	Tobacco and Tobacco Products	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785
12	Rubber Products	.00191 .00486 .01972	0.00000 .00562 .01972	0.00000 .00658 .01972	0.00000 .00685 .01972	0.00000 .00720 .01971	0.00000 .00720 .01971
13	Leather and Leather Products	0.00000 .00039 .01766	0.00000 .00050 .01765	0.00000 .00044 .01766	0.00000 .00047 .01765	0.00000 .00051 .01765	0.00000 .00051 .01765
14	Cotton Yarn and Cloth	.00021 .00224 .02856	0.00000 .00114 .02856	0.00000 .00213 .02856	0.00000 .00197 .02856	0.00000 .00420 .02856	0.00000 .00420 .02856
15	Synthetic Textiles	0.00000 .00387 .03485	0.00000 .00194 .03486	0.00000 .00344 .03486	0.00000 .00318 .03486	0.00000 .00739 .03486	0.00000 .00739 .03486
16	Knitting Mills	0.00000 .00003 .01176	0.00000 .00002 .01176	0.00000 .00003 .01176	0.00000 .00003 .01176	0.00000 .00005 .01176	0.00000 .00005 .01176



Construction- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
236	.17908	0.00000	.01389	.40585	0.00000	0.00000	0.00000	.00007	0.00000	1
046	.15671	.04561	.04199	.13495	.01447	.14737	.01155	.01625	.01173	
051	.16051	.16052	.16052	.16052	.16052	.16052	.16051	.16052	.16051	
837	.00191	.01052	.00231	.00025	.00248	.00267	.00232	.00182	.00195	2
527	.03542	.02477	.01489	.03201	.02800	.02313	.01899	.03671	.01915	
259	.06260	.06260	.06260	.06259	.06259	.06260	.06260	.06259	.06260	
000	.05195	0.00000	0.00000	0.00000	0.00000	.14991	0.00000	0.00000	0.00000	3
119	.04114	.01310	.01074	.00843	.00943	.09568	.00564	.01073	.00687	
364	.10363	.10363	.10363	.10364	.10363	.10364	.10363	.10364	.10364	
290	.01036	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	4
566	.00965	.00801	.00341	.00256	.00224	.00366	.00176	.00212	.00209	
709	.03709	.03709	.03710	.03709	.03709	.03710	.03709	.03709	.03710	
062	.05113	0.00000	.03317	0.00000	0.00000	.00011	0.00000	0.00000	0.00000	5
448	.04834	.01175	.01271	.05361	.00269	.01593	.00223	.00300	.00204	
435	.04435	.04435	.04436	.04435	.04435	.04436	.04436	.04436	.04435	
044	.00007	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	6
123	.00108	.00118	.00088	.00092	.00091	.00098	.00070	.00083	.00089	
395	.02395	.02396	.02396	.02396	.02395	.02395	.02395	.02395	.02396	
766	.01447	.06853	.00498	.00003	0.00000	.00060	0.00000	0.00000	0.00000	7
315	.01166	.02696	.00429	.00151	.00081	.00157	.00064	.00086	.00061	
709	.02709	.02708	.02708	.02708	.02708	.02708	.02708	.02708	.02708	
816	.16557	.09192	.04600	0.00000	0.00000	.00144	.00378	0.00000	0.00000	8
654	1.05493	.02998	.02016	.01154	.01483	.01688	.00991	.01741	.00850	
098	.09098	.09098	.09098	.09097	.09097	.09098	.09097	.09098	.09098	
000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	9
066	.00075	1.00073	.00056	.00060	.00097	.00069	.00060	.00102	.00069	
174	.01174	.01173	.01174	.01173	.01173	.01174	.01174	.01174	.01174	
000	.00045	.00235	.03388	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	10
217	.00222	.00258	1.00299	.00176	.00181	.00190	.00141	.00169	.00156	
111	.02111	.02112	.02111	.02111	.02111	.02111	.02111	.02110	.02111	
000	0.00000	0.00000	0.00000	.14477	0.00000	0.00000	0.00000	0.00000	0.00000	11
000	0.00000	0.00000	0.00000	1.02451	0.00000	0.00000	0.00000	0.00000	0.00000	
785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	
000	0.00000	0.00000	0.00000	0.00000	.13767	.01055	0.00000	0.00000	.00053	12
627	.00774	.00730	.00634	.00643	1.02917	.01220	.00579	.00750	.00746	
972	.01972	.01972	.01972	.01972	.01972	.01972	.01972	.01971	.01972	
000	0.00000	0.00000	0.00000	0.00000	.00263	.19505	0.00000	0.00000	.00413	13
049	.00070	.00063	.00069	.00045	.00217	1.04829	.00058	.00095	.00193	
765	.01765	.01765	.01765	.01765	.01765	.01765	.01765	.01765	.01765	
000	0.00000	0.00000	0.00000	0.00000	.01191	.01128	.29332	.04317	.10050	14
148	.00204	.00139	.00117	.00182	.01851	.01387	1.15088	.03706	.08877	
856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	
000	0.00000	0.00000	0.00000	0.00000	.09903	0.00000	.14553	.10617	.18211	15
256	.00353	.00250	.00215	.00300	.03904	.01381	.11474	1.04499	.10670	
485	.03485	.03486	.03485	.03486	.03485	.03486	.03486	.03486	.03486	
000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	.03537	16
003	.00004	.00003	.00003	.00003	.00005	.00007	.00021	.00011	1.00153	
175	.01175	.01176	.01175	.01176	.01175	.01176	.01175	.01175	.01176	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper
	Industry	17	18	19	20	21	22
1	Agriculture, Forestry and Fishing	.02772 .01435 .16051	.00257 .01156 .16051	.00027 .01057 .16051	.00010 .01141 .16052	.02237 .01569 .16052	.00000 .01000 .16000
2	Mining	.00015 .01480 .06259	.00147 .02002 .06259	0.00000 .01937 .06260	.00174 .02157 .06260	.00141 .01828 .06259	.02000 .02000 .06000
3	Meat and Poultry	0.00000 .00489 .10363	0.00000 .00576 .10363	0.00000 .00295 .10364	0.00000 .00470 .10364	0.00000 .00376 .10363	0.00000 .00000 .10000
4	Dairy Products	0.00000 .00175 .03709	0.00000 .00185 .03709	0.00000 .00173 .03709	0.00000 .00189 .03709	0.00000 .00182 .03709	0.00000 .00000 .03000
5	Grain Mills	0.00000 .00488 .04435	0.00000 .00223 .04436	0.00000 .00160 .04436	0.00000 .00188 .04436	0.00000 .00435 .04436	.00000 .00000 .04000
6	Biscuits and Bakeries	0.00000 .00073 .02395	0.00000 .00077 .02396	0.00000 .00075 .02395	0.00000 .00080 .02396	0.00000 .00076 .02396	0.00000 .00000 .02000
7	Sugar and Confectioneries	0.00000 .00056 .02708	0.00000 .00057 .02708	0.00000 .00040 .02708	0.00000 .00052 .02708	0.00000 .00049 .02708	0.00000 .00000 .02000
8	Other Food Industries	.00101 .00684 .09098	.00007 .00835 .09098	0.00000 .00263 .09098	0.00000 .00645 .09098	0.00000 .00423 .09098	.00000 .00000 .09000
9	Soft Drinks	0.00000 .00053 .01173	0.00000 .00066 .01174	0.00000 .00046 .01174	0.00000 .00059 .01173	0.00000 .00049 .01174	0.00000 .00000 .01000
10	Distilleries, Breweries and Wineries	0.00000 .00129 .02111	0.00000 .00158 .02111	0.00000 .00148 .02111	0.00000 .00148 .02111	0.00000 .00143 .02111	.00000 .00000 .02000
11	Tobacco and Tobacco Products	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00000
12	Rubber Products	.00058 .00673 .01972	.00693 .00875 .01972	0.00000 .00446 .01972	0.00000 .00552 .01972	0.00000 .00525 .01971	0.00000 .00000 .01000
13	Leather and Leather Products	.00083 .00130 .01765	.00051 .00099 .01765	0.00000 .00034 .01765	.00075 .00080 .01765	0.00000 .00055 .01765	0.00000 .00000 .01000
14	Cotton Yarn and Cloth	.12324 .09133 .02856	.06435 .06672 .02856	0.00000 .00096 .02856	.01850 .01747 .02856	0.00000 .00141 .02856	0.00000 .00000 .02000
15	Synthetic Textiles	.07197 .08880 .03486	.15834 .08907 .03486	0.00000 .00162 .03485	.04872 .02230 .03486	.00158 .00261 .03485	0.00000 .00000 .03000
16	Knitting Mills	.03608 .00308 .01176	.00077 .00027 .01176	0.00000 .00002 .01176	0.00000 .00006 .01176	0.00000 .00003 .01176	0.00000 .00000 .01000





Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Electrical Appliances	Electrical Industrial Equipment	Communication Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic
	Industry	33	34	35	36	37	38
1	Agriculture, Forestry and Fishing	0.00000 .00941 .16052	0.00000 .00811 .16052	0.00000 .00904 .16051	0.00000 .01161 .16052	.00027 .01103 .16052	0.00000 .01000 .16052
2	Mining	.00446 .05793 .06259	.00183 .04212 .06260	.00155 .03751 .06260	.00322 .04557 .06260	.08203 .04172 .06260	.01000 .03000 .06000
3	Meat and Poultry	0.00000 .00442 .10364	0.00000 .00442 .10363	0.00000 .00475 .10364	0.00000 .00573 .10363	0.00000 .00443 .10364	0.00000 .00000 .10000
4	Dairy Products	0.00000 .00215 .03709	0.00000 .00184 .03709	0.00000 .00200 .03710	0.00000 .00248 .03710	0.00000 .00244 .03710	0.00000 .00000 .03000
5	Grain Mills	0.00000 .00168 .04435	0.00000 .00138 .04435	0.00000 .00156 .04436	0.00000 .00207 .04435	0.00000 .00193 .04436	0.00000 .00000 .04000
6	Biscuits and Bakeries	0.00000 .00094 .02396	0.00000 .00081 .02395	0.00000 .00088 .02395	0.00000 .00108 .02395	0.00000 .00106 .02396	0.00000 .00000 .02000
7	Sugar and Confectioneries	0.00000 .00054 .02708	0.00000 .00044 .02708	0.00000 .00050 .02708	0.00000 .00066 .02708	0.00000 .00059 .02708	0.00000 .00000 .02000
8	Other Food Industries	0.00000 .00565 .09097	0.00000 .00372 .09098	0.00000 .00493 .09098	0.00000 .00751 .09097	.00092 .00453 .09097	.00000 .00000 .09000
9	Soft Drinks	0.00000 .00062 .01174	0.00000 .00052 .01173	0.00000 .00057 .01173	0.00000 .00078 .01174	0.00000 .00068 .01174	0.00000 .00000 .01000
10	Distilleries, Breweries and Wineries	0.00000 .00182 .02111	0.00000 .00148 .02111	0.00000 .00144 .02111	0.00000 .00231 .02111	0.00000 .00214 .02110	0.00000 .00000 .02000
11	Tobacco and Tobacco Products	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00785	0.00000 0.00000 .00000
12	Rubber Products	0.00000 .00572 .01972	0.00000 .00549 .01972	.00394 .00658 .01972	0.00000 .00835 .01972	0.00000 .00667 .01972	.02000 .01000 .01000
13	Leather and Leather Products	.00026 .00096 .01765	.00389 .00164 .01765	.00258 .00172 .01765	.00004 .00122 .01765	0.00000 .00056 .01765	.00000 .00000 .01000
14	Cotton Yarn and Cloth	0.00000 .00112 .02856	0.00000 .00102 .02856	0.00000 .00131 .02856	0.00000 .00151 .02856	.00016 .00135 .02856	0.00000 .00000 .02000
15	Synthetic Textiles	0.00000 .00197 .03486	0.00000 .00167 .03486	.00071 .00264 .03486	0.00000 .00288 .03486	0.00000 .00210 .03486	0.00000 .00000 .08000
16	Knitting Mills	0.00000 .00002 .01176	0.00000 .00002 .01176	0.00000 .00002 .01176	0.00000 .00005 .01176	0.00000 .00003 .01176	0.00000 .00000 .07000



Chemical and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceuticals and Medicines	Other Chemical Industries	Miscellaneous Manufacturing Industries	Construction, Maintenance and Repair	Transportation, Storage and Trade	Utilities	Communications and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	49	
0000	0.00000	.00031	.00189	.00217	.00171	.00356	.01815	0.00000	.00426	.00321	1
1176	.03482	.03313	.02076	.03661	.01568	.00970	.01036	.00398	.02057	.02967	
6051	.16051	.16051	.16051	.16051	.16052	.16051	.16051	.16052	.16051	.16051	
7685	.00029	.00606	.00492	.02320	.00203	.00928	.00066	.00589	.00019	.00002	2
1131	.07000	.04302	.02445	.06508	.02919	.03533	.02180	.01134	.00883	.02617	
6259	.06260	.06260	.06260	.06259	.06259	.06260	.06260	.06260	.06260	.06259	
0000	0.00000	0.00000	0.00000	.01417	.00013	0.00000	.00033	0.00000	.00935	.00599	3
0548	.02415	.01651	.00957	.01640	.00954	.00305	.00355	.00180	.00656	.01109	
0363	.10364	.10363	.10363	.10363	.10363	.10364	.10364	.10363	.10363	.10363	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	.00039	0.00000	.00725	.00386	4
0213	.00332	.00367	.00436	.00332	.00277	.00163	.00207	.00111	.00379	.00583	
3709	.03709	.03709	.03710	.03709	.03709	.03709	.03709	.03709	.03709	.03710	
0000	0.00000	0.00000	0.00000	.00016	0.00000	0.00000	.00050	0.00000	.00073	.00038	5
0201	.00698	.00771	.00452	.00721	.00290	.00184	.00340	.00068	.00407	.00570	
4435	.04436	.04435	.04436	.04436	.04436	.04436	.04435	.04436	.04436	.04436	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	.00438	.00224	6
0090	.00112	.00123	.00171	.00111	.00117	.00070	.00087	.00050	.00078	.00207	
2395	.02395	.02396	.02395	.02395	.02396	.02396	.02395	.02396	.02396	.02396	
0000	0.00000	0.00000	.00389	.00010	.00004	0.00000	.00002	0.00000	.00073	.00044	7
0058	.00198	.00215	.00324	.00193	.00084	.00039	.00051	.00024	.00146	.00188	
2708	.02708	.02708	.02708	.02708	.02708	.02708	.02708	.02708	.02708	.02708	
0000	.01140	.03873	.01456	.03087	.00033	0.00000	.00007	0.00000	.00576	.00364	8
0693	.04195	.03129	.01347	.02132	.01138	.00339	.00325	.00152	.00561	.01148	
9097	.09097	.09098	.09098	.09098	.09098	.09098	.09098	.09098	.09098	.09098	
0000	.00047	0.00000	.00372	.00141	0.00000	0.00000	0.00000	0.00000	.00166	.00210	9
0068	.00199	.00135	.00130	.00107	.00097	.00040	.00049	.00027	.00041	.00107	
1173	.01174	.01173	.01173	.01174	.01173	.01174	.01173	.01173	.01174	.01174	
0000	0.00000	0.00000	0.00000	.00020	0.00000	.00004	.00073	0.00000	0.00000	.01001	10
0169	.00242	.00248	.00350	.00228	.00233	.00100	.00129	.00060	.00089	.00214	
2110	.02111	.02111	.02111	.02111	.02111	.02111	.02111	.02111	.02111	.02111	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	11
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	
0785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	.00785	
0000	0.00000	.00700	0.00000	.00390	.02361	.00316	.00236	0.00000	.00013	.02213	12
0562	.01458	.01080	.01251	.00897	.01463	.00463	.00440	.00205	.00301	.01178	
1972	.01971	.01972	.01972	.01972	.01972	.01972	.01972	.01972	.01971	.01972	
0017	.00027	0.00000	0.00000	.00088	.00807	.00004	.00002	0.00000	.00012	.00121	13
0058	.00306	.00120	.00137	.00127	.00396	.00055	.00035	.00016	.00029	.00133	
1765	.01765	.01765	.01765	.01766	.01766	.01765	.01765	.01766	.01765	.01765	
0000	0.00000	0.00000	0.00000	0.00000	.00124	.00004	.00079	0.00000	.00142	.00021	14
0123	.00226	.00174	.00186	.00178	.00548	.00196	.00196	.00050	.00152	.00396	
2856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	.02856	
0000	0.00000	0.00000	0.00000	.00034	.00508	.00061	.00110	0.00000	.00009	.00009	15
0205	.00502	.00382	.00340	.00358	.01133	.00375	.00273	.00075	.00170	.00783	
3486	.03485	.03485	.03486	.03486	.03485	.03485	.03485	.03486	.03485	.03485	
0000	0.00000	0.00000	0.00000	0.00000	.00043	0.00000	0.00000	0.00000	0.00000	0.00000	16
0003	.00010	.00004	.00004	.00004	.00013	.00003	.00008	.00001	.00002	.00010	
1175	.01175	.01175	.01176	.01176	.01176	.01176	.01176	.01176	.01175	.01176	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Biscuits and Confectionery
	Industry	1	2	3	4	5	6
17	Clothing Industries	.00014 .00042 .06937	0.00000 .00040 .06936	0.00000 .00057 .06937	0.00000 .00054 .06937	0.00000 .00069 .06936	0.00000 .00069 .06936
18	Other Textile Mills	.00580 .00684 .04215	.00105 .00269 .04215	.00045 .00968 .04216	.00002 .00864 .04216	.01605 .01318 .04216	.00000 .00000 .04216
19	Sawmills	.00024 .00323 .00929	.00001 .00258 .00929	0.00000 .00369 .00929	0.00000 .00337 .00929	0.00000 .00295 .00928	0.00000 .00000 .00000
20	Furniture and Fixtures	0.00000 .00018 .02102	0.00000 .00013 .02102	0.00000 .00017 .02102	0.00000 .00016 .02101	0.00000 .00024 .02102	0.00000 .00000 .02102
21	Other Wood Industries	.00178 .00318 .00985	.00010 .00265 .00985	.00170 .00499 .00985	.00104 .00468 .00985	0.00000 .00421 .00985	0.00000 .00000 .00000
22	Pulp and Paper Mills	0.00000 .00778 .02908	0.00000 .00765 .02907	.00119 .01284 .02907	.00173 .01704 .02908	.00310 .01970 .02907	.00000 .02907 .02907
23	Paper Products	.00087 .01190 .03598	.00089 .00926 .03598	.00973 .01915 .03597	.01973 .02432 .03597	.02406 .02600 .03598	.03598 .03598 .03598
24	Printing and Publishing	0.00000 .02030 .04599	.00000 .02864 .04598	.00094 .02474 .04598	.00214 .02897 .04599	.00246 .03104 .04598	.00246 .03104 .04598
25	Iron and Steel Mills	0.00000 .01702 .05880	.00187 .02271 .05880	0.00000 .01910 .05879	0.00000 .01827 .05880	.00285 .01976 .05880	0.00000 .01976 .05880
26	Other Primary Metals	0.00000 .01428 .05481	.01452 .02791 .05481	.00001 .01457 .05482	0.00000 .01495 .05481	0.00000 .01542 .05481	0.00000 .01542 .05481
27	Fabricated and Structural Metals	0.00000 .00139 .00456	0.00000 .00176 .00457	0.00000 .00126 .00456	0.00000 .00126 .00456	0.00000 .00121 .00456	0.00000 .00121 .00456
28	Metal Stamping, Pressing and Coating	.00003 .00480 .01524	.00156 .00395 .01525	.00416 .00793 .01524	.00425 .00582 .01524	.00115 .01096 .01524	.00115 .01096 .01524
29	Other Metal Fabricating Industries	.00309 .02169 .06398	.02783 .03123 .06398	0.00000 .02565 .06399	0.00000 .02754 .06399	0.00000 .02818 .06398	0.00000 .02818 .06398
30	Miscellaneous Machinery	.01228 .00267 .00763	.00079 .00144 .00763	0.00000 .01017 .00763	0.00000 .00903 .00763	0.00000 .00721 .00763	0.00000 .00721 .00763
31	Motor Vehicles and Aircraft	.00032 .00623 .23033	0.00000 .00912 .23033	0.00000 .00736 .23032	0.00000 .00806 .23033	0.00000 .00878 .23033	0.00000 .00878 .23033
32	Other Transportation Equipment	.00018 .00102 .01090	.00133 .00167 .01090	0.00000 .00118 .01091	0.00000 .00112 .01090	0.00000 .00136 .01090	0.00000 .00136 .01090



7	8	9	10	11	12	13	14	15	16	Industry No.
Food and Confectioneries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00143	0.00000	0.00000	17
00050	.00059	.00052	.00038	.00053	.00047	.00058	.00110	.00055	.00071	
06936	.06936	.06936	.06936	.06936	.06937	.06937	.06937	.06937	.06936	
00080	.00104	0.00000	0.00000	.00001	.00102	.01851	.06278	.06482	.16944	18
00464	.00816	.00411	.00397	.00771	.01668	.01725	.07156	.03580	.08616	
04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	19
00223	.00295	.00268	.00233	.00436	.00251	.00343	.00199	.00255	.00223	
00928	.00929	.00929	.00929	.00929	.00928	.00929	.00929	.00929	.00929	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	20
00011	.00016	.00012	.00012	.00016	.00020	.00033	.00070	.00056	.00127	
02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	
00000	.00007	.00133	.00101	.00444	.00030	.00124	0.00000	.00001	0.00000	21
00353	.00400	.00351	.00280	.00561	.00308	.00452	.00267	.00363	.00334	
00986	.00985	.00985	.00985	.00985	.00985	.00985	.00985	.00985	.00985	
01313	.00415	0.00000	.00377	.00450	.00273	.00493	.00145	.03316	.00143	22
03643	.02323	.03046	.02108	.02159	.02189	.01799	.02343	.03452	.02614	
02908	.02907	.02908	.02908	.02908	.02908	.02908	.02908	.02907	.02908	
04127	.02436	.06166	.03635	.03427	.00537	.01089	.00487	.00552	.00805	23
04143	.03082	.03479	.02318	.02688	.01933	.02081	.01591	.02170	.01703	
03597	.03598	.03598	.03598	.03598	.03597	.03598	.03597	.03597	.03597	
0436	.00652	.00900	.00785	.00446	.00079	.00074	.00075	.00027	.00109	24
03946	.03497	.04087	.02911	.02806	.02902	.03020	.02259	.02686	.02517	
04599	.04599	.04598	.04599	.04598	.04598	.04599	.04598	.04599	.04599	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	25
01637	.05051	.03861	.01783	.01545	.01897	.01903	.01041	.01635	.01112	
05880	.05880	.05879	.05880	.05879	.05880	.05880	.05879	.05879	.05880	
00000	0.00000	0.00000	0.00000	.01196	0.00000	0.00000	0.00000	0.00000	0.00000	26
01442	.02290	.02041	.01309	.02273	.01822	.01911	.01095	.01578	.01246	
0481	.05481	.05481	.05481	.05481	.05481	.05481	.05481	.05481	.05481	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	27
0096	.00119	.00100	.00076	.00115	.00112	.00127	.00087	.00098	.00089	
0456	.00456	.00457	.00456	.00456	.00456	.00456	.00456	.00457	.00456	
0316	.05711	.04359	.01122	.00004	.00078	0.00000	0.00000	.00034	0.00000	28
0847	.01722	.00993	.00645	.00370	.00878	.00655	.00473	.01008	.00462	
0524	.01525	.01524	.01525	.01525	.01525	.01525	.01525	.01525	.01525	
00000	0.00000	0.00000	0.00000	0.00000	.01144	.01496	0.00000	0.00000	.00002	29
0792	.03356	.03396	.02347	.02649	.02808	.03161	.01947	.02384	.02172	
0398	.06398	.06399	.06399	.06399	.06398	.06398	.06399	.06398	.06398	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	30
0227	.00537	.00180	.00160	.00774	.00125	.00301	.00096	.00114	.00103	
0763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	
00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	31
0891	.00935	.01027	.00743	.00799	.00811	.00893	.00604	.00703	.00668	
0033	.23033	.23033	.23033	.23033	.23033	.23032	.23033	.23033	.23033	
00000	0.00000	0.00000	0.00000	0.00000	.00018	0.00000	0.00000	0.00000	0.00000	32
0100	.00124	.00106	.00074	.00110	.00114	.00133	.00072	.00088	.00075	
0090	.01091	.01091	.01090	.01090	.01091	.01091	.01090	.01090	.01090	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	
	Industry	17	18	19	20	21	
17	Clothing Industries	.03998 1.00239 .06937	.00020 .00066 .06936	0.00000 .00047 .06936	0.00000 .00047 .06937	0.00000 .00051 .06936	0.00000 .00000 .00000
18	Other Textile Mills	.11212 .07135 .04216	.18534 1.07473 .04216	0.00000 .00202 .04216	.02502 .01737 .04216	.00001 .00304 .04216	.00000 .00000 .00000
19	Sawmills	0.00000 .00228 .00929	.00027 .00394 .00929	.28937 1.14119 .00929	.04155 .03789 .00929	.19219 .11614 .00928	.00000 .00000 .00000
20	Furniture and Fixtures	0.00000 .00097 .02101	.00448 .00146 .02102	0.00000 .00040 .02102	.03147 1.00157 .02102	.00378 .00075 .02102	0.00000 .00000 .00000
21	Other Wood Industries	0.00000 .00311 .00985	.00357 .00423 .00986	.05047 .03148 .00985	.05028 .01463 .00985	.10209 1.03154 .00985	.00000 .00000 .00000
22	Pulp and Paper Mills	.00067 .01789 .02908	.00299 .02427 .02908	0.00000 .00685 .02908	.00247 .01735 .02908	.01711 .01668 .02908	.00000 1.00000 .00000
23	Paper Products	.00615 .01403 .03597	.00575 .01612 .03597	0.00000 .00599 .03598	.01475 .01526 .03597	.00405 .00982 .03598	.00000 .00000 .00000
24	Printing and Publishing	0.00000 .02052 .04598	.00065 .02517 .04598	0.00000 .02242 .04598	.00047 .02296 .04598	0.00000 .02149 .04599	.00000 .00000 .00000
25	Iron and Steel Mills	0.00000 .01008 .05880	.00028 .01304 .05879	0.00000 .00914 .05879	.00006 .05597 .05880	.00207 .01630 .05880	0.00000 .00000 .00000
26	Other Primary Metals	0.00000 .01148 .05481	.00361 .01564 .05481	0.00000 .00966 .05481	.00005 .03083 .05482	.00665 .01909 .05481	0.00000 .00000 .00000
27	Fabricated and Structural Metals	.00017 .00077 .00456	0.00000 .00122 .00457	0.00000 .00090 .00456	.05938 .00377 .00457	0.00000 .00140 .00456	0.00000 .00000 .00000
28	Metal Stamping, Pressing and Coating	0.00000 .00408 .01525	.00017 .00503 .01525	0.00000 .00194 .01524	.00006 .00456 .01525	.00045 .00297 .01525	.00000 .00000 .00000
29	Other Metal Fabricating Industries	.00014 .01816 .06398	.00267 .02299 .06399	0.00000 .02100 .06398	.06719 .03264 .06398	.01849 .02410 .06399	0.00000 .00000 .00000
30	Miscellaneous Machinery	.00018 .00130 .00763	.00001 .00108 .00763	0.00000 .00102 .00763	0.00000 .00139 .00763	0.00000 .00147 .00763	0.00000 .00000 .00000
31	Motor Vehicles and Aircraft	0.00000 .00565 .23033	0.00000 .00695 .23033	0.00000 .00668 .23033	0.00000 .00895 .23033	.00027 .00740 .23033	0.00000 .00000 .00000
32	Other Transportation Equipment	0.00000 .00072 .01091	0.00000 .00086 .01090	0.00000 .00092 .01091	.00083 .00218 .01090	0.00000 .00133 .01091	0.00000 .00000 .00000



Paper Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscellaneous Machinery	Motor Vehicles and Aircraft	Other Transportation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	17
0047	.00044	.00036	.00039	.00029	.00035	.00041	.00034	.00042	.00037	
6937	.06937	.06937	.06936	.06937	.06937	.06936	.06937	.06937	.06937	
0580	.00070	.00000	.00001	0.00000	.00002	.00017	.00030	.01164	.00051	18
0725	.00312	.00212	.00249	.00162	.00207	.00292	.00211	.01259	.00362	
4216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	
0000	0.00000	0.00000	.00012	.00086	.00100	.00172	.00127	.00132	.00892	19
0753	.00234	.00173	.00335	.00176	.00236	.00436	.00361	.00371	.00993	
0929	.00929	.00929	.00928	.00929	.00928	.00929	.00929	.00929	.00929	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	.00025	0.00000	.00006	.00014	20
0024	.00012	.00009	.00014	.00007	.00010	.00016	.00011	.00026	.00023	
2102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	
1044	.00001	.00028	.00154	.00010	.00008	.00351	.00404	.00043	.00236	21
1103	.00350	.00182	.00389	.00165	.00246	.00351	.00307	.00296	.00471	
0985	.00985	.00985	.00986	.00985	.00985	.00985	.00985	.00985	.00985	
5945	.06514	.00048	.00019	0.00000	.00149	.00055	.00133	.00043	0.00000	22
2419	.03445	.00660	.01162	.00505	.00896	.00970	.01152	.00991	.00701	
2908	.02907	.02908	.02907	.02908	.02908	.02908	.02908	.02907	.02908	
1034	.00248	.00005	.01341	0.00000	.00772	.00700	.01923	.00290	.00010	23
5759	.00891	.00729	.01935	.00571	.01062	.01369	.01379	.01361	.00978	
3597	.03598	.03598	.03598	.03598	.03597	.03598	.03597	.03598	.03598	
0087	.03445	.00014	.00003	0.00000	.00063	.00051	.00012	.00006	0.00000	24
0197	1.03998	.02779	.02178	.02217	.02327	.02733	.02070	.02420	.02143	
4598	.04598	.04598	.04598	.04598	.04598	.04599	.04599	.04599	.04598	
0360	0.00000	.18517	.04700	.35844	.39615	.15863	.20014	.06563	.14643	25
699	.01284	1.05722	.07000	.10010	.12127	.09789	.07543	.08130	.12114	
6880	.05879	.05879	.05879	.05880	.05880	.05880	.05880	.05880	.05880	
357	.00046	.01912	.32789	.00593	.05648	.13025	.08997	.04895	.03709	26
557	.01342	.03165	1.19096	.03327	.06719	.10791	.07098	.08373	.08183	
481	.05481	.05481	.05481	.05481	.05481	.05482	.05481	.05482	.05481	
0000	.00034	0.00000	0.00000	0.00000	0.00000	.01303	0.00000	.00052	.00005	27
0101	.00115	.00101	.00200	1.00122	.00170	.00221	.00123	.00158	.00301	
0456	.00456	.00456	.00457	.00456	.00456	.00457	.00456	.00456	.00456	
0086	.00003	.00003	.00429	0.00000	.00004	.00694	.00030	.00345	0.00000	28
511	.00258	.00250	.00539	.00207	1.00379	.00413	.00310	.00525	.00453	
525	.01524	.01525	.01524	.01525	.01525	.01525	.01524	.01525	.01525	
071	.00290	.00313	.03931	.03573	.05649	.07706	.02562	.02024	.11753	29
585	.03091	.03040	.04837	.02567	.03296	1.04496	.02912	.03902	.06166	
398	.06399	.06399	.06398	.06399	.06399	.06399	.06398	.06399	.06399	
000	0.00000	0.00000	.00040	0.00000	.00002	.00469	.01275	.00414	.00005	30
122	.00144	.00123	.00165	.00108	.00138	.00186	1.00131	.00300	.00191	
763	.00763	.00763	.00763	.00763	.00763	.00763	.00764	.00763	.00763	
000	0.00000	0.00000	.00623	0.00000	0.00000	.02047	.00053	.28998	.01611	31
785	.01018	.00819	.01522	.00752	.00940	.02107	.00840	1.12746	.02270	
033	.23032	.23032	.23033	.23033	.23033	.23033	.23033	.23032	.23033	
000	0.00000	0.00000	.00079	0.00000	0.00000	.01198	.00129	.00059	.16445	32
102	.00086	.00112	.00251	.00129	.00189	.00486	.00167	.00192	1.03555	
090	.01090	.01090	.01090	.01090	.01090	.01090	.01091	.01090	.01091	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Electrical Appliances	Electrical Industrial Equipment	Communi- cations Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non- metals
	Industry	33	34	35	36	37	
17	Clothing Industries	0.00000 .00042 .06937	0.00000 .00036 .06936	0.00000 .00037 .06937	0.00000 .00053 .06936	0.00000 .00056 .06936	0.00000 .00056 .06936
18	Other Textile Mills	.00003 .00278 .04216	.00002 .00227 .04216	.00018 .00269 .04216	.00005 .00392 .04216	.00005 .00293 .04216	.00005 .00293 .04216
19	Sawmills	0.00000 .00307 .00929	0.00000 .00236 .00928	0.00000 .00283 .00929	0.00000 .00330 .00929	.00002 .00261 .00929	.00002 .00261 .00929
20	Furniture and Fixtures	.00052 .00014 .02102	0.00000 .00015 .02102	.00036 .00018 .02102	.00034 .00023 .02102	0.00000 .00012 .02102	.00000 .00012 .02102
21	Other Wood Industries	.00274 .00363 .00986	.00137 .00264 .00985	.00167 .00350 .00986	.00018 .00427 .00986	.00111 .00280 .00985	.00111 .00280 .00985
22	Pulp and Paper Mills	.00089 .01913 .02908	.00038 .00929 .02908	.00224 .01378 .02908	.00407 .01992 .02907	.00949 .01505 .02908	.00949 .01505 .02908
23	Paper Products	.03878 .02229 .03598	.00247 .01550 .03597	.01402 .02044 .03598	.02533 .02421 .03597	.00735 .01205 .03597	.00735 .01205 .03597
24	Printing and Publishing	.00122 .02841 .04598	.00008 .02338 .04598	.00066 .02259 .04598	.00112 .03368 .04598	.00007 .03325 .04598	.00007 .03325 .04598
25	Iron and Steel Mills	.21682 .09222 .05879	.12046 .06772 .05880	.03837 .05320 .05880	.09294 .06348 .05879	.01231 .02265 .05880	.01231 .02265 .05880
26	Other Primary Metals	.08781 .09264 .05482	.14040 .12396 .05481	.19983 .16325 .05481	.16943 .12504 .05481	.00008 .01972 .05481	.00008 .01972 .05481
27	Fabricated and Structural Metals	0.00000 .00130 .00456	0.00000 .00099 .00456	0.00000 .00111 .00456	0.00000 .00148 .00456	0.00000 .00136 .00456	0.00000 .00136 .00456
28	Metal Stamping, Pressing and Coating	.00013 .00461 .01525	.00022 .00361 .01524	.00015 .00468 .01524	.00064 .00691 .01525	.00019 .00303 .01524	.00019 .00303 .01524
29	Other Metal Fabricating Industries	.01790 .03500 .06399	.00246 .03371 .06398	.00253 .03632 .06399	.01413 .04333 .06399	.01643 .03499 .06399	.01643 .03499 .06399
30	Miscellaneous Machinery	0.00000 .00135 .00763	0.00000 .00116 .00763	0.00000 .00123 .00763	0.00000 .00163 .00763	.00002 .00153 .00763	.00002 .00153 .00763
31	Motor Vehicles and Aircraft	.00026 .01020 .23033	.00067 .00987 .23033	.00103 .01055 .23033	.00354 .01398 .23033	0.00000 .01005 .23033	0.00000 .01005 .23033
32	Other Transportation Equipment	0.00000 .00147 .01090	0.00000 .00122 .01090	0.00000 .00138 .01090	0.00000 .00173 .01090	0.00000 .00157 .01091	0.00000 .00157 .01091



and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Construction, Maintenance and Repair	Transporta- tion, Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Industry No.
39	40	41	42	43	44	45	46	47	48	49	
0000	0.00000	0.00000	0.00000	.00006	.00056	0.00000	.00147	0.00000	.00007	.00112	17
0051	.00066	.00058	.00068	.00055	.00061	.00041	.00041	.00015	.00022	.00087	
0937	.06936	.06936	.06937	.06937	.06936	.06936	.06936	.06936	.06936	.06936	
0000	.00005	0.00000	0.00000	.00109	.01210	.00583	.00173	0.00000	.00093	.00365	18
0352	.00703	.00424	.00474	.00454	.00966	.00379	.00308	.00130	.00234	.00678	
0216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	.04216	
0000	.00004	0.00000	0.00000	.00037	.00856	.02096	.00058	.00163	.00005	.00021	19
0315	.00595	.00271	.00331	.00340	.01237	.02152	.00228	.00442	.00356	.00413	
0929	.00929	.00928	.00929	.00929	.00929	.00929	.00928	.00929	.00929	.00929	
0000	0.00000	0.00000	0.00000	0.00000	.00147	.00155	.00003	0.00000	.00005	0.00000	20
0015	.00037	.00014	.00018	.00017	.00050	.00037	.00011	.00015	.00017	.00028	
0102	.02102	.02102	.02102	.02102	.02102	.02102	.02102	.02120	.02102	.02102	
0038	.00127	.00001	.00011	.00057	.01415	.03374	.00020	0.00000	.00086	.00003	21
0322	.00649	.00317	.00390	.00391	.00778	.00864	.00221	.00343	.00357	.00477	
0985	.00986	.00985	.00985	.00985	.00985	.00986	.00985	.00985	.00985	.00985	
0000	.00099	.00023	.00482	.01090	.01220	.00300	.00162	0.00000	.00070	.00273	22
0884	.03233	.02012	.03103	.02505	.02449	.01029	.00681	.00263	.00467	.03045	
0908	.02908	.02908	.02908	.02908	.02908	.02908	.02907	.02908	.02907	.02908	
0176	.00391	.00608	.04446	.02388	.01663	.00575	.00562	0.00000	.00077	.01227	23
0176	.04263	.02612	.03167	.02609	.02282	.01144	.00672	.00302	.00556	.01966	
0598	.03597	.03597	.03597	.03597	.03597	.03597	.03598	.03597	.03597	.03598	
0006	.00007	.00445	.01760	.00320	.00518	0.00000	0.00094	.00031	.00092	.16583	24
0574	.03885	.03970	.05695	.03597	.03784	.01480	.01971	.00949	.01435	.03203	
0599	.04598	.04598	.04598	.04599	.04598	.04598	.04598	.04599	.04598	.04598	
0644	0.00000	0.00000	0.00000	.00359	.01130	.01512	.00047	0.00000	.00001	.00056	25
0344	.03650	.04426	.03110	.03353	.04670	.05705	.01100	.00823	.00943	.04949	
0880	.05880	.05879	.05879	.05879	.05880	.05880	.05879	.05879	.05879	.05880	
0000	0.00000	0.00000	0.00000	.00442	.03061	.03136	.00023	0.00000	.00013	.00140	26
0421	.03586	.02509	.02318	.02843	.04954	.05650	.01032	.00914	.01018	.05075	
0482	.05481	.05481	.05482	.05482	.05481	.05481	.05481	.05481	.05481	.05481	
0000	0.00000	0.00000	0.00000	.00018	.00135	.02399	.00003	0.00000	0.00000	0.00000	27
0183	.00166	.00122	.00133	.00135	.00158	.00194	.00108	.00195	.00193	.00301	
0457	.00457	.00457	.00457	.00456	.00457	.00457	.00456	.00456	.00456	.00456	
0302	.00163	.04142	.02269	.01920	.02631	.01188	.00118	0.00000	0.00000	0.00000	28
0702	.02717	.01706	.00712	.01180	.00896	.00351	.00206	.00165	.00268	.00747	
0524	.01524	.01525	.01524	.01524	.01525	.01525	.01524	.01525	.01524	.01524	
0000	0.00000	0.00000	0.00000	.00297	.01369	.07728	.00182	0.00000	.00032	.10917	29
0565	.03810	.03665	.04534	.03458	.03934	.02869	.01893	.01414	.01711	.03757	
0398	.06399	.06399	.06399	.06398	.06398	.06398	.06399	.06398	.06399	.06399	
0000	0.00000	0.00000	0.00000	0.00000	.00081	.00268	.00070	.00168	.00082	.00311	30
0189	.00188	.00175	.00201	.00184	.00167	.00138	.00120	.00102	.00104	.00260	
0763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	.00763	
0000	0.00000	0.00000	0.00000	0.00000	.00053	.00112	.00323	0.00000	0.00000	.02783	31
0336	.01006	.01047	.01460	.00987	.01145	.00852	.00707	.00294	.00412	.02347	
0333	.23033	.23033	.23033	.23032	.23033	.23032	.23033	.23033	.23033	.23033	
0000	0.00000	0.00000	0.00000	.00012	.00033	0.00000	.00232	0.00000	0.00000	.00012	32
0243	.00141	.00124	.00131	.00132	.00150	.00233	.00118	.00039	.00047	.00339	
0990	.01091	.01090	.01090	.01091	.01090	.01091	.01090	.01091	.01090	.01090	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Agriculture, Forestry and Fishing	Mining	Meat and Poultry	Dairy Products	Grain Mills	Other
	Industry	1	2	3	4	5	
33	Electrical Appliances	0.00000 .00039 .01421	0.00000 .00059 .01422	0.00000 .00040 .01421	0.00000 .00042 .01421	0.00000 .00043 .01421	0.00000 .00043 .01421
34	Electrical Industrial Equipment	0.00000 .00090 .00437	0.00000 .00117 .00437	0.00000 .00099 .00437	0.00000 .00109 .00437	0.00000 .00112 .00437	0.00000 .00112 .00437
35	Communication Equipment	.00008 .00221 .01555	0.00000 .00266 .01555	0.00000 .00225 .01555	0.00000 .00223 .01555	0.00000 .00223 .01555	0.00000 .00223 .01555
36	Other Electrical Products	0.00000 .00252 .00825	0.00000 .00337 .00825	0.00000 .00279 .00825	0.00000 .00308 .00825	0.00000 .00322 .00825	0.00000 .00322 .00825
37	Clay, Lime and Cement	.00007 .00364 .01073	.00375 .00456 .01072	0.00000 .00350 .01073	0.00000 .00363 .01072	0.00000 .00359 .01073	0.00000 .00359 .01073
38	Other Non-metallic Mineral Products	.00002 .00273 .01638	0.00000 .00282 .01638	.00008 .00349 .01638	.00194 .00402 .01637	0.00000 .00598 .01638	0.00000 .00598 .01638
39	Petroleum Refineries and Coal Products	.04977 .02125 .07296	.01227 .01240 .07297	.00171 .05112 .07296	.00566 .04623 .07297	.00300 .03921 .07297	.00300 .03921 .07297
40	Plastics and Synthetic Resins	.00001 .00362 .01493	.00002 .00368 .01494	.00583 .00682 .01493	.00085 .00541 .01493	.00019 .00650 .01494	.00019 .00650 .01494
41	Paint and Varnish	0.00000 .00300 .01034	0.00000 .00368 .01034	0.00000 .00334 .01035	0.00000 .00360 .01035	0.00000 .00373 .01034	0.00000 .00373 .01034
42	Pharmaceuticals and Medicines	0.00000 .00285 .01671	0.00000 .00147 .01671	0.00000 .00233 .01671	0.00000 .00212 .01671	0.01534 .00348 .01671	0.01534 .00348 .01671
43	Other Chemical Industries	.02832 .02875 .07358	.04628 .02858 .07357	.00088 .05270 .07357	.00084 .04444 .07357	.00011 .04619 .07357	.00011 .04619 .07357
44	Miscellaneous Manufacturing Industries	.00016 .00620 .03998	.00009 .00791 .03998	.00011 .00821 .03998	.00008 .00795 .03998	0.00000 .00905 .03998	0.00000 .00905 .03998
45	Construction, Maintenance and Repair	.02403 .01868 .09376	.02169 .01766 .09376	.00214 .03425 .09376	.00311 .03249 .09376	.00241 .03024 .09376	.00241 .03024 .09376
46	Transportation, Storage and Trade	.07148 .09039 .64264	.04199 .08013 .64265	.03917 .14966 .64264	.02154 .13994 .64264	.11241 .14617 .64264	.11241 .14617 .64264
47	Utilities	.00806 .01314 .08516	.03476 .01945 .08516	.00372 .01963 .08516	.00584 .01942 .08515	.00706 .01909 .08516	.00706 .01909 .08516
48	Communications and Other Services	.05195 .07649 .89616	.05459 .08380 .89616	.00939 .11926 .89617	.02059 .12185 .89617	.01564 .12360 .89617	.01564 .12360 .89617
49	Unallocated Sector	.05028 .06024 .20308	.10698 .05434 .20308	.02861 .10338 .20308	.05085 .10204 .20308	.05511 .10611 .20308	.05511 .10611 .20308



Confection- eries	Other Food Industries	Soft Drinks	Distilleries, Breweries and Wineries	Tobacco and Tobacco Products	Rubber Products	Leather and Leather Products	Cotton Yarn and Cloth	Synthetic Textiles	Knitting Mills	Industry No.
7	8	9	10	11	12	13	14	15	16	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	33
0041	.00050	.00050	.00041	.00042	.00060	.00078	.00031	.00038	.00036	
0422	.01421	.01422	.01421	.01422	.01422	.01422	.01421	.01421	.01422	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	34
0116	.00131	.00139	.00102	.00103	.00114	.00126	.00083	.00099	.00092	
0437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00436	.00437	
0000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	35
0192	.00270	.00211	.00170	.00213	.00452	.00257	.00254	.00513	.00263	
555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	
0000	0.00000	0.00000	.00081	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	36
0330	.00380	.00393	.00321	.00296	.00359	.00356	.00255	.00345	.00279	
0825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	
0007	0.00000	0.00000	0.00000	0.00000	.00258	.00046	0.00000	0.00000	0.00000	37
0314	.00474	.00380	.00396	.00350	.00422	.00304	.00239	.00356	.00238	
073	.01072	.01072	.01073	.01073	.01073	.01072	.01073	.01073	.01073	
0069	.01250	.00658	.02921	0.00000	.00054	0.00000	0.00000	.00512	0.00000	38
0438	.00958	.00635	.01122	.00279	.00570	.00354	.00454	.00753	.00485	
0638	.01637	.01638	.01637	.01637	.01638	.01638	.01638	.01637	.01637	
0206	.00233	.00824	.00232	.00078	.00300	.00308	.00169	.00613	.00198	39
0542	.03262	.01288	.01089	.03923	.02253	.02088	.01558	.02890	.01578	
0297	.07296	.07296	.07296	.07297	.07296	.07297	.07296	.07297	.07297	
0026	.00220	0.00000	0.00000	.00513	.10855	.01023	.00049	.00264	.00318	40
0680	.00821	.00813	.00662	.00702	.03825	.01713	.00732	.01067	.01010	
0493	.01493	.01493	.01494	.01494	.01493	.01493	.01494	.01493	.01494	
0000	0.00000	0.00000	0.00000	0.00000	.00546	0.00000	0.00000	0.00000	0.00000	41
0377	.00494	.00490	.00334	.00337	.00588	.00400	.00291	.00389	.00337	
0034	.01035	.01035	.01034	.01034	.01034	.01034	.01034	.01035	.01034	
0000	.00027	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	42
0129	.00328	.00136	.00166	.00191	.00335	.00170	.00188	.00454	.00195	
0671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	
0053	.03412	.00075	.00564	.00035	.05717	.01829	.01818	.24078	.00862	43
0035	.05405	.03192	.02510	.04410	.19320	.05602	.10888	.12488	.11764	
0357	.07357	.07357	.07357	.07357	.07358	.07357	.07357	.07357	.07357	
0005	.00310	.00326	.00879	.00021	.00498	.03037	.00032	.00028	.00247	44
0887	.01092	.01059	.00874	.00844	.02794	.02195	.00900	.01296	.01166	
0998	.03998	.03997	.03998	.03997	.03998	.03998	.03998	.03997	.03998	
0345	.00213	.00388	.00294	.00309	.00251	.00200	.00541	.00419	.00224	45
0912	.02639	.01713	.01375	.02844	.01775	.02039	.01653	.01841	.01740	
0376	.09376	.09376	.09376	.09376	.09376	.09376	.09375	.09375	.09376	
0760	.05231	.04714	.02585	.03878	.02875	.05994	.03279	.03058	.02479	46
0463	.14525	.11055	.08349	.12941	.09953	.12113	.09197	.10338	.09516	
0265	.64264	.64264	.64264	.64264	.64264	.64264	.64264	.64264	.64264	
0496	.00404	.00529	.00621	.00137	.00831	.00460	.01158	.00655	.00479	47
0524	.02038	.01362	.01167	.01588	.02147	.01599	.02151	.02576	.01804	
0516	.08516	.08516	.08516	.08516	.08515	.08516	.08516	.08516	.08516	
0946	.01936	.03099	.03378	.01688	.02915	.03052	.01501	.02286	.04348	48
0916	.12196	.10769	.08023	.11101	.09506	.10508	.07984	.09127	.08772	
0516	.89617	.89617	.89616	.89617	.89617	.89617	.89617	.89617	.89617	
0888	.06928	.13363	.09546	.05789	.06467	.06918	.03905	.04568	.05073	49
0755	.10964	.07767	.05850	.09000	.09103	.09389	.08176	.09455	.08484	
0309	.20309	.20308	.20309	.20308	.20309	.20308	.20308	.20309	.20309	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Clothing Industries	Other Textile Mills	Sawmills	Furniture and Fixtures	Other Wood Industries	Pulp and Paper
	Industry	17	18	19	20	21	22
33	Electrical Appliances	0.00000 .00049 .01422	0.00000 .00044 .01422	0.00000 .00030 .01422	0.00000 .00078 .01421	0.00000 .00049 .01422	0.00000 .00049 .01422
34	Electrical Industrial Equipment	0.00000 .00087 .00437	0.00000 .00096 .00437	0.00000 .00085 .00437	0.00000 .00095 .00437	0.00000 .00087 .00437	0.00000 .00087 .00437
35	Communication Equipment	0.00000 .00201 .01555	.00010 .00277 .01555	0.00000 .00144 .01555	.00266 .00292 .01556	0.00000 .00173 .01556	0.00000 .00173 .01556
36	Other Electrical Products	0.00000 .00251 .00825	.00001 .00293 .00825	0.00000 .00241 .00825	.00307 .00300 .00825	0.00000 .00266 .00825	0.00000 .00266 .00825
37	Clay, Lime and Cement	0.00000 .00194 .01073	.00003 .00256 .01073	0.00000 .00209 .01072	0.00000 .00369 .01073	.00006 .00338 .01073	.00006 .00338 .01073
38	Other Non-metallic Mineral Products	0.00000 .00360 .01638	.00034 .00490 .01638	0.00000 .00295 .01638	.00469 .00530 .01638	.01340 .00728 .01637	.01340 .00728 .01637
39	Petroleum Refineries and Coal Products	.00057 .01347 .07296	.00253 .01618 .07297	.01218 .01458 .07296	.00151 .01354 .07296	.00268 .01653 .07296	.00268 .01653 .07296
40	Plastics and Synthetic Resins	.00037 .01067 .01493	.01051 .01239 .01493	0.00000 .00257 .01493	.03141 .01074 .01493	.00379 .00529 .01494	.00379 .00529 .01494
41	Paint and Varnish	0.00000 .00280 .01035	.00095 .00362 .01035	0.00000 .00271 .01035	.00907 .00444 .01035	.00075 .00292 .01035	.00075 .00292 .01035
42	Pharmaceuticals and Medicines	0.00000 .00135 .01671	.00003 .00197 .01671	0.00000 .00067 .01671	0.00000 .00136 .01671	0.00000 .00094 .01671	0.00000 .00094 .01671
43	Other Chemical Industries	.00093 .07517 .07357	.01596 .11396 .07357	.00043 .01355 .07357	.00452 .07168 .07357	.01132 .02527 .07358	.01132 .02527 .07358
44	Miscellaneous Manufacturing Industries	.02805 .01256 .03998	.00869 .01322 .03998	0.00000 .00631 .03998	.00232 .01254 .03998	.00821 .00845 .03998	.00821 .00845 .03998
45	Construction, Maintenance and Repair	.00082 .01530 .09376	.00364 .01586 .09376	.00751 .01644 .09376	.00288 .01618 .09376	.00392 .01810 .09376	.00392 .01810 .09376
46	Transportation, Storage and Trade	.04888 .08258 .64264	.03985 .09429 .64265	.08933 .10886 .64264	.06390 .09342 .64264	.11063 .11184 .64265	.11063 .11184 .64265
47	Utilities	.00221 .01437 .08516	.00521 .01754 .08516	.01003 .01384 .08516	.00522 .01610 .08515	.00807 .01676 .08516	.00807 .01676 .08516
48	Communications and Other Services	.03066 .07617 .89617	.01947 .08463 .89617	.02496 .07951 .89617	.03370 .08222 .89617	.02780 .08415 .89617	.02780 .08415 .89617
49	Unallocated Sector	.03689 .07323 .20308	.05433 .08179 .20309	.06102 .06595 .20308	.04850 .07672 .20309	.04360 .07524 .20309	.04360 .07524 .20309



Products	Printing and Publishing	Iron and Steel Mills	Other Primary Metals	Fabricated and Structural Metals	Metal Stamping, Pressing and Coating	Other Metal Fabricating Industries	Miscellaneous Machinery	Motor Vehicles and Aircraft	Other Transportation Equipment	Industry No.
23	24	25	26	27	28	29	30	31	32	
000	0.00000	0.00000	.00089	0.00000	0.00000	.00490	.00333	.00598	0.00000	33
046	.00047	.00043	.00120	.00052	.00077	.00131	.00068	.00322	.00153	
422	.01422	.01422	.01421	.01422	.01422	.01422	.01421	.01421	.01422	
000	0.00000	0.00000	0.00000	0.00000	.00148	.00038	0.00000	.00154	0.00000	34
105	.00136	.00102	.00109	.00083	.00093	.00156	.00107	.00234	.00111	
437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	
000	0.00000	0.00000	.00057	0.00000	0.00000	.00151	0.00000	.00653	0.00000	35
277	.00226	.00188	.00260	.00143	.00189	.00267	.00162	.00636	.00232	
555	.01555	.01555	.01555	.01556	.01555	.01555	.01555	.01555	.01555	
000	0.00000	.00222	.00176	0.00000	.00061	.00112	0.00000	.00387	.00162	36
318	.00385	.00351	.00382	.00337	.00400	.00418	.00313	.00536	.00398	
825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	
493	0.00000	.01587	.00912	.00001	0.00000	.00047	.00037	.00011	.00016	37
701	.00293	.00962	.01183	.01026	.01271	.00933	.00871	.00714	.00825	
073	.01073	.01073	.01073	.01073	.01073	.01073	.01073	.01072	.01073	
281	0.00000	0.00000	.00001	0.00000	.00001	.00002	.00041	.01216	0.00000	38
526	.00271	.00231	.00262	.00164	.00211	.00280	.00201	.01156	.00271	
637	.01637	.01637	.01638	.01637	.01637	.01638	.01638	.01637	.01638	
815	.00089	.00151	.01504	.00001	.00147	.00262	.00490	.00135	.00302	39
884	.00815	.00986	.01926	.00688	.01061	.01250	.01060	.01206	.01116	
296	.07296	.07296	.07296	.07296	.07296	.07297	.07296	.07296	.07296	
769	.00175	0.00000	.00032	.00018	.00021	.00019	.00020	.00030	.00085	40
999	.00401	.00288	.00416	.00234	.00429	.00434	.00403	.01040	.00637	
493	.01493	.01493	.01493	.01493	.01493	.01494	.01494	.01494	.01493	
000	0.00000	0.00000	.00036	.00266	.01340	.00328	.00686	.00725	.00424	41
376	.00435	.00318	.00345	.00280	.00382	.00440	.00323	.00725	.00470	
034	.01034	.01035	.01034	.01035	.01034	.01035	.01034	.01035	.01034	
000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	42
80	.00134	.00094	.00087	.00068	.00083	.00089	.00073	.00094	.00076	
571	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	
226	.01138	.00681	.00768	.00003	.00036	.00194	.00007	.00168	.00016	43
515	.02516	.02443	.02620	.01787	.02669	.02360	.02133	.03511	.02452	
557	.07357	.07358	.07357	.07357	.07357	.07357	.07357	.07357	.07357	
661	.00022	0.00000	0.00000	0.00000	.00180	.00117	.00045	.00526	.01769	44
770	.00954	.00689	.00640	.00543	.00641	.00778	.00571	.01071	.01210	
98	.03998	.03997	.03997	.03998	.03997	.03998	.03998	.03997	.03998	
226	.00680	.00529	.01142	.00319	.00258	.00417	.00336	.00474	.00557	45
86	.02013	.01695	.02259	.01324	.01792	.01879	.01684	.01736	.01773	
75	.09376	.09376	.09376	.09376	.09376	.09376	.09375	.09376	.09376	
99	.01343	.02524	.05093	.01792	.03421	.03981	.04848	.04863	.04109	46
72	.08969	.08067	.09987	.06807	.08369	.09488	.07456	.10079	.08927	
65	.64264	.64264	.64264	.64265	.64264	.64264	.64264	.64264	.64264	
95	.00999	.02428	.02342	.00402	.00485	.00675	.00378	.00347	.01049	47
66	.01282	.02528	.03304	.02171	.02824	.02427	.02072	.01946	.02443	
15	.08516	.08516	.08516	.08517	.08515	.08515	.08516	.08516	.08515	
92	.14143	.01439	.02148	.01813	.03178	.03417	.05129	.01927	.02386	48
29	.10481	.08196	.08527	.06636	.07971	.08884	.07214	.08667	.08156	
17	.89617	.89617	.89617	.89617	.89617	.89617	.89617	.89617	.89617	
62	.16231	.08536	.03863	.05118	.03417	.07036	.04314	.04641	.03173	49
91	.05477	.07252	.08193	.07456	.09552	.08300	.07140	.08826	.08762	
08	.20308	.20308	.20308	.20308	.20309	.20308	.20308	.20309	.20308	

Table A1 – Direct, Indirect and Induced Output Effects by Sector, per Dollar Increase of Final Demand – Continued

Industry No.		Electrical Appliances	Electrical Industrial Equipment	Communication Equipment	Other Electrical Products	Clay, Lime and Cement	Other Non-metallic
	Industry	33	34	35	36	37	38
33	Electrical Appliances	.00859 1.00082 .01422	.00080 .00067 .01421	0.00000 .00077 .01422	0.00000 .00117 .01421	0.00000 .00054 .01422	0.00000 .00000 .01000
34	Electrical Industrial Equipment	.07578 .00194 .00437	.00181 1.00139 .00437	.00791 .00212 .00437	0.00000 .00171 .00437	0.00000 .00122 .00437	0.00000 .00000 .00000
35	Communication Equipment	.00561 .00730 .01556	.04418 .01139 .01555	.13169 1.02278 .01555	.02975 .00838 .01555	0.00000 .00207 .01555	0.00000 .00000 .01000
36	Other Electrical Products	.00222 .01015 .00825	.07800 .00533 .00825	.00365 .00484 .00825	.01773 1.00536 .00824	0.00000 .00363 .00825	.00000 .00000 .00000
37	Clay, Lime and Cement	.00001 .01011 .01073	0.00000 .00911 .01072	.00036 .00881 .01073	.00088 .00921 .01073	.12904 1.02329 .01072	.03000 .01000 .01000
38	Other Non-metallic Mineral Products	.00107 .00482 .01638	.01721 .00775 .01637	.01636 .00938 .01637	.00661 .00619 .01637	.01089 .00691 .01637	.18000 1.04000 .01000
39	Petroleum Refineries and Coal Products	.00462 .01383 .07296	.00149 .01268 .07297	.00349 .01605 .07296	.00271 .01823 .07296	.01247 .01428 .07296	.01000 .01000 .07000
40	Plastics and Synthetic Resins	.01662 .00946 .01493	.00372 .00929 .01494	.02208 .01147 .01493	.04178 .01706 .01493	.00141 .00416 .01494	.00000 .01000 .01000
41	Paint and Varnish	.01689 .00507 .01034	.00282 .00399 .01034	.00480 .00429 .01034	.00660 .00536 .01035	0.00000 .00389 .01035	0.00000 .00000 .01000
42	Pharmaceuticals and Medicines	0.00000 .00115 .01671	0.00000 .00086 .01671	0.00000 .00104 .01671	0.00000 .00167 .01671	0.00000 .00107 .01671	0.00000 .00000 .01000
43	Other Chemical Industries	.00129 .04618 .07357	.00082 .02889 .07357	.00075 .04584 .07357	.01343 .07223 .07357	.00277 .02632 .07357	.00000 .00000 .07000
44	Miscellaneous Manufacturing Industries	.00002 .01041 .03998	0.00000 .01053 .03998	.00038 .01016 .03998	.03636 .01942 .03998	.00035 .00854 .03998	.00000 .00000 .03000
45	Construction, Maintenance and Repair	.00266 .01931 .09375	.00231 .01735 .09376	.00257 .01969 .09376	.00244 .02163 .09376	.00667 .02011 .09376	.00000 .00000 .09000
46	Transportation, Storage and Trade	.04377 .09809 .64264	.03475 .08680 .64264	.04020 .09267 .64264	.05516 .11312 .64264	.09994 .10596 .64264	.00000 .10000 .60000
47	Utilities	.00663 .02581 .08516	.00482 .02251 .08515	.00406 .02355 .08516	.00519 .02598 .08516	.01476 .01982 .08516	.00000 .00000 .08000
48	Communications and Other Services	.03438 .09357 .89617	.03439 .08088 .89617	.04651 .08643 .89617	.03841 .10698 .89617	.04028 .10362 .89617	.00000 .00000 .80000
49	Unallocated Sector	.06352 .09196 .20308	.05307 .07720 .20309	.04693 .07681 .20308	.09126 .09321 .20309	.10786 .07941 .20308	.00000 .00000 .20000



and Coal Products	Plastics and Synthetic Resins	Paint and Varnish	Pharmaceu- ticals and Medicines	Other Chemical Industries	Miscel- laneous Manufac- turing Industries	Construction, Maintenance and Repair	Trans- portation Storage and Trade	Utilities	Communi- cations and Other Services	Unallocated Sector	Industry No.
40	41	42	43	44	45	46	47	48	49		
00 0.00000	0.00000	0.00000	0.00000	0.00000	.00648	0.00000	0.00000	0.00000	0.00000	.00060	33
52 .00141	.00059	.00072	.00061	.00139	.00085	.00033	.00025	.00030	.00152		
22 .01422	.01422	.01422	.01422	.01422	.01422	.01421	.01422	.01421	.01422	.01422	
00 0.00000	0.00000	0.00000	0.00000	0.00000	.00361	.00578	.00001	0.00000	0.00000	.00499	34
15 .00199	.00150	.00196	.00147	.00235	.00097	.00083	.00074	.00088	.00144		
37 .00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	.00437	
00 .00272	0.00000	0.00000	.00874	.00334	.01726	.00007	0.00000	.00006	.00369		35
07 .01223	.00622	.00061	.00598	.00530	.00484	.00159	.00192	.00209	.00452		
56 .01555	.01555	.01855	.01555	.01555	.01555	.01555	.01555	.01555	.01555	.01555	
00 0.00000	0.00000	0.00000	.00192	.00914	.01197	.00029	0.00000	.00000	.01379		36
36 .00683	.00481	.00632	.00444	.00581	.00305	.00229	.00183	.00224	.00452		
25 .00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	.00825	
17 .00334	.00130	0.00000	.00083	.00078	.05157	.00005	0.00000	.00013	.00010		37
57 .00635	.00465	.00755	.00503	.00575	.01226	.00266	.00478	.00472	.00514		
72 .01073	.01073	.01073	.01073	.01072	.01073	.01073	.01073	.01072	.01072		
00 0.00000	.00150	.06813	.00651	.00933	.01114	.00023	0.00000	.00016	.00396		38
22 .01309	.00768	.02295	.00832	.00788	.00629	.00186	.00171	.00230	.00607		
38 .01637	.01638	.01637	.01638	.01637	.01638	.01638	.01637	.01638	.01638		
57 .00370	.00591	.00327	.05005	.00229	.01237	.02095	.00547	.00256	.00111		39
03 .05984	.03276	.01700	.02941	.01843	.01310	.00904	.00557	.00604	.01997		
96 .07297	.07296	.07296	.07296	.07297	.07296	.07297	.07296	.07297	.07296		
00 .07576	.05878	.00261	.01104	.10443	.00012	.00028	0.00000	.00003	.00021		40
56 1.03939	.02101	.01063	.01245	.03230	.00601	.00287	.00117	.00230	.01458		
03 .01493	.01493	.01494	.01493	.01493	.01493	.01494	.01493	.01493	.01493		
57 .00505	.05622	0.00000	.00166	.00361	.00532	.00002	0.00000	.00101	.01469		41
29 .00761	1.00962	.00655	.00537	.00667	.00323	.00258	.00158	.00215	.00566		
5 .01034	.01034	.01035	.01035	.01034	.01035	.01034	.01035	.01034	.01035		
00 0.00000	0.00000	.02995	.01046	0.00000	.00004	0.00000	0.00000	.00098	.00297		42
6 .01040	.00529	1.00332	.00394	.00238	.00066	.00070	.00034	.00063	.00178		
1 .01671	.01671	.01671	.01671	.01671	.01671	.01671	.01671	.01672	.01671		
3 .63382	.24742	.05534	.17192	.00777	.00308	.00038	.00027	.00248	.02536		43
1 .24998	.15449	.05073	1.08284	.13533	.02187	.01435	.00649	.01070	.04552		
7 .07357	.07357	.07357	.07357	.07358	.07358	.07357	.07357	.07357	.07357		
4 .10548	.00091	.00847	.01155	.08222	.00699	.00125	0.00000	.00168	.02978		44
9 .04224	.02311	.01609	.01525	1.03440	.00644	.00547	.00295	.00439	.01346		
8 .03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998	.03998		
1 .00388	.00263	.00413	.00796	.00358	.00057	.01850	.05329	.05817	0.00000		45
9 .02812	.02283	.02272	.02329	.02011	1.01661	.01378	.01928	.01130	.03784		
6 .09376	.09376	.09376	.09376	.09376	.09376	.09375	.09375	.09376	.09376		
8 .01387	.04842	.04101	.05874	.03699	.10803	.06559	.01326	.01330	.26928		46
5 .16193	.12940	.13803	.12056	.11693	.07858	1.05715	.03642	.04616	.11209		
4 .64264	.64264	.64264	.64264	.64264	.64265	.64264	.64265	.64265	.64264		
0 .00482	.00323	.00272	.02660	.00556	.00087	.00735	.18251	.00276	0.00000		47
2 .04407	.02537	.01848	.02800	.02078	.01554	.00734	1.04395	.00484	.01952		
5 .08516	.08516	.08516	.08515	.08516	.08516	.08516	.08516	.08515	.08516		
9 .00894	.04591	.07560	.03470	.04410	.04609	.07810	.04369	.08850	.24443		48
7 .14025	.12309	.14626	.11332	.11380	.07052	.06163	.04309	1.04826	.15388		
6 .89617	.89617	.89617	.89617	.89617	.89616	.89617	.89617	.89617	.89617		
0 .02391	.09906	.21527	.09388	.10893	.00742	.07533	.02811	.05086	0.00000		49
4 .16946	.11134	.09428	.09747	.09563	.07294	.03524	.02500	.02822	1.13717		
8 .20309	.20308	.20308	.20308	.20308	.20308	.20308	.30309	.20309	.20309		

**Table A2 --**  
**Sectoral Classification of the 1965 Ontario Input-Output Table --**  
**Industry Titles and Definitions on the Basis of the Standard Industrial Classification<sup>1</sup>**

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
1	Agriculture, Forestry and Fishing	011, 013, 015, 017, 019, 021, 031, 039, 041, 045, 047
2	Mining	051, 052, 053, 054, 055, 056, 057, 058, 059, 061, 063, 065, 066, 071, 073, 077, 079, 083, 087, 092, 094, 096, 098, 099
3	Meat and Poultry	101, 103
4	Dairy Products	105, 107
5	Grain Mills	123, 125, 125
6	Biscuits and Bakeries	128, 129
7	Sugar and Confectioneries	131, 133
8	Other Food Industries	111, 112, 135, 139
9	Soft Drinks	141
10	Distilleries, Breweries and Wineries	143, 145, 147
11	Tobacco and Tobacco Products	15, 153
12	Rubber Products	161, 163, 169
13	Leather and Leather Products	172, 174, 175, 179
14	Cotton Yarn and Cloth	183
15	Synthetic Textiles	201
16	Knitting Mills	231, 239
17	Clothing Industries	243, 244, 245, 246, 247, 248, 249
18	Other Textile Mills	193, 197, 211, 212, 213, 214, 215, 216, 218, 219, 221, 223, 229
19	Sawmills	251
20	Furniture and Fixtures	261, 264, 266, 268
21	Other Wood Industries	252, 254, 256, 258, 259
22	Pulp and Paper Mills	271
23	Paper Products	272, 273, 274
24	Printing and Publishing	286, 287, 288, 289
25	Iron and Steel Mills	291
26	Other Primary Metals Industries	292, 294, 295, 296, 297, 298
27	Fabricated and Structural Metals	302
28	Metal Stamping, Pressing and Coating	304
29	Other Metal Fabricating Industries	301, 303, 305, 306, 307, 308, 309, 315
30	Miscellaneous Machinery	311, 316, 318
31	Motor Vehicles and Aircraft	321, 323, 324, 325
32	Other Transportation Equipment	326, 327, 328, 329
33	Electrical Appliances	331, 332
34	Electrical Industrial Equipment	336
35	Communication Equipment	334, 335, 338
36	Other Electrical Products	337, 339
37	Clay, Lime and Cement	341, 343, 345, 347, 348, 351, 352, 353
38	Other Non-metallic Mineral Products	354, 355, 356, 357, 359
39	Petroleum Refineries and Coal Products	365, 369
40	Plastics and Synthetic Resins	373
41	Paint and Varnish	375
42	Pharmaceuticals and Medicines	374
43	Other Chemical Industries	371, 372, 377, 378, 379
44	Miscellaneous Manufacturing Industries	381, 382, 383, 384, 385, 393, 395, 397, 398, 399
45	Construction, Maintenance and Repair	404, 406, 409, 421

<sup>1</sup>1960 classification system.



Table A2 —  
 Total Classification of the 1965 Ontario Input-Output Table —  
 Industry Titles and Definitions on the Basis of the Standard Industrial Classification  
 (continued)

Industry Number	Input-Output Industry Title	Standard Industrial Classification Number
	Transportation, Storage and Trade	602, 604, 606, 608, 611, 613, 614, 615, 616, 617, 618, 619, 621, 622, 623, 624, 625, 626, 627, 629, 631, 642, 647, 649, 652, 654, 656, 658, 663, 665, 667, 669, 673, 676, 678, 681, 691, 692, 693, 694, 695, 696, 697, 699, 501, 502, 504, 505, 506, 507, 508, 509, 512, 515, 516, 517, 519, 524, 527
	Utilities	572, 574, 576, 579
	Communications and Other Services	543, 544, 545, 548, 801, 803, 805, 807, 809, 821, 823, 825, 827, 828, 842, 851, 853, 859, 871, 872, 873, 874, 875, 876, 877, 878, 879, 894, 896, 897, 702, 704, 731, 735, 861, 862, 864, 866, 869, 737, 831, 891, 893, 899
	Unallocated Sector	



















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Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. W. Darcy McKeough, Treasurer of Ontario  
and Minister of Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

May/June 1972

Volume 10, Number 3

## The Ontario Economy

## The Ontario Government and

## The Pickering Airport Site

Ministry of Treasury, Economics and Intergovernmental Affairs

## Selected Economic Indicators

A publication of the  
Ministry of Treasury, Economics  
and Intergovernmental Affairs  
Government of Ontario

Hon. W. Darcy McKeough  
*Treasurer of Ontario and  
Minister of Economics and  
Intergovernmental Affairs*

H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

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### About the Review

While the decision to build a second international airport for the Toronto area was a federal government decision, the government of Ontario played a major role in the process of selecting that site. In order to clarify the nature of that role the Hon. W. Darcy McKeough tabled in the Legislature on June 6th, a collection of Provincial documents compiled during the course of the four-year decision-making process.

The feature article for the May/June issue of the *Ontario Economic Review* is based on two of these documents. The first is a background paper which explains the context in which each of the documents was produced, summarizes their contents and outlines the reasons for the policy decisions that were made at the various stages. The second, which forms an appendix to the article, is the essence of a provincial report which evaluated the proposed airport sites in Beverly Township and Pickering Township according to the impact they would have on the Toronto-Centred Region in terms of: stimulation of growth in the eastern corridor; establishment of a linear arrangement for a system of cities and services and; development of peripheral urban centres such as Port Hope and Cobourg.

The article appearing in this issue was edited for publication by John J. Morning, who departs as editor of the *Ontario Economic Review* and *Ontario Statistical Review* to join the Ministry's Organization Development unit.

### Indicator Charts, Pages 8-10

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs; some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 8-10 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



While the value of the Canadian dollar continues to rise, the merchandise trade balance in shows marked deterioration. Imports continue to rise more rapidly than exports. In the first four months of 1972 total imports advanced 21.7 per cent, almost three times the 7.3 per cent rate of growth of exports. The deteriorating trade performance is a reflection of two basic factors — a marked increase in Canada's deficit in trade in manufactured products and an overall reduction in foreign demand for Canadian goods.

In merchandise trade during April, Canada imported \$1.51 billion worth of goods, compared to \$1.28 billion in the same month of last year. Canada exported \$1.48 billion worth of goods in April, up from \$1.39 billion a year earlier. The above figures do not include re-exports. When re-exports are included Canada had a surplus and not a deficit in April of this year. The basic figures (excluding re-exports are included), however, do not indicate a healthy trade situation. If the deficit continues through May and June, Canada will have its first quarterly trade deficit since the second quarter of 1966 when a \$49 million deficit was recorded. Data for the first quarter of 1972 show a surplus of \$10 million. However, rapidly rising imports and lagging exports have steadily reduced trade surpluses since the high of \$947 million reached in the last quarter of 1970. The slow growth of Canadian exports increases the difficulty of reducing the relatively high levels of unemployment we are currently experiencing. A continuous expansion of exports to other countries is needed if the number of new jobs in Canada is going to keep up with the number of people entering the labour force.

Aggravating the difficulties in export trade is the continuous upward pressure on the Canadian dollar. On June 7, the dollar strengthened to a closing value of 102.34 cents (U.S.) — the highest the dollar has reached since the latter part of 1960. The dollar has risen by almost three per cent since the beginning of the year, when it was trading at approximately 99.5 cents (U.S.). The recent strength in the Canadian dollar reflects a variety of developments, including a general weakness of the U.S. dollar in international currency markets, increased borrowings abroad by the provinces, and the attraction of foreign investment capital because of Canada's relatively strong economic performance. Significant to this development are the

much higher short-term interest rates in Canada than in other major industrial countries and in the Eurodollar market. This factor, as well as speculation that the Canadian dollar will rise further has caused an inflow in the past few months of short-term capital which has been reflected in the rise of the trading value of the Canadian dollar.

The Bank of Canada is reported to be following a middle-of-the-road approach, attempting to hold down the value of the dollar or at least slow its rise, while endeavouring to moderate the growth in money and credit in the economy. It has not been too successful in this approach so far, as the dollar has appreciated significantly and the growth of the money supply has continued at a high 18 per cent at annual rates. The Bank of Canada is faced with the problem of trying to hold down the rate of exchange. To do so, it must supply large amounts of money to the economy. This would encourage inflation which some economists fear already poses a serious threat to economic stability in Canada throughout the rest of the year.

Statistics Canada data also reveal increasing reliance upon the United States. Canadian exports to the U.S. have increased and Canada maintains a surplus in merchandise trade with that country, but exports to other countries are running below last year's levels. The latest figures also show that the United States is reducing the trade deficit with Canada. Imports from the United States were \$1,067.0 million in April, up from \$926.9 million in April, 1971. Canadian exports to the United States rose to \$1,100.8 million from \$986 million over the same period. By comparison imports from the U.S. rose by \$142 million while exports were up only \$114 million.

The increase in sales to the United States has been a major factor in keeping Canada's total export figure on a rising trend. However, with imports from the U.S. going up at a much faster rate the result has been that the United States has steadily taken a larger share of Canada's overall trade. Several sources have advanced the argument that such a large portion of its trade with the United States ties Canada closer to that country than does ownership of Canadian firms by U.S. interests. The heavy trade leaves Canada vulnerable to U.S. governmental actions, such as the imposition of an import surtax, in a manner unequalled by the ownership of Canadian firms.

The increase in the tempo of domestic economic activity has contributed to the expansion in imports, whereas exports suffered from the slowdown in some overseas countries and the unusually severe winter which particularly influenced wheat shipments. Exports to the U.S., however, rose as the economy there appeared to be moving into a period of more rapid expansion.

In addition, there has been a shift in the trade position in motor vehicles and parts. In the first quarter, there was a motor vehicle deficit of \$60 million, compared with a \$50 million surplus in the first quarter of 1971. The surplus in motor vehicle trade with the United States declined to \$59.7 million from \$102.5 million over the same period. Statistics Canada reports that the declining surplus resulted mainly from increased imports of parts. The deficit with other countries widened by approximately \$67.0 million mostly from increased imports of vehicles.

## Index of Industrial Production

The Canadian index of industrial production moved ahead in April after very small advances in the first quarter of the year. Data recently released by Statistics Canada show that the index rose to 188.3 in April, up 2.1 per cent from 184.4 in March. The March level was unchanged from February, and there was only a gain of 0.3 per cent in January and February. The index is based on 1961 output of manufacturing, mining and electric power, gas and water utilities.

The report for April showed strong gains in both durable and non-durable goods manufacturing, which combined account for about one-quarter of Canada's total output. Durable goods output, led by a 10.3 per cent gain in production in the wood industries, rose by 3.1 per cent. Non-durable manufacturing was up 2.1 per cent. Mining production increased by 2.0 per cent largely due to a 4.2 per cent increase in output of the metal mines. Only electric power, gas and water experienced a decline.

The index of industrial production measures approximately one-third of Canada's total output, and its three principal components (manufacturing, mining and the utilities) are those which most readily reflect rises or declines in the cycle of business activity. The index measures the physical volume of output in Canada exclusive of any increase in value due to price rises. The data is adjusted to eliminate seasonal fluctuations which result from high production in the



summer months and reduced output during the winter slowdown.

All components of the durable goods segment rose with the strongest gains being made in transportation and equipment, electrical products and non-metallic mineral products, as well as wood industries. Demand for durable goods is usually regarded as a good indication of underlying strength or weakness in the economy. Demand for non-durables, such as food, clothing and fuel, tends to remain more constant. Output of the petroleum and coal products industries, however, rose 8.0 per cent last month. Food, tobacco and rubber industry output rose between two and three per cent.

#### Gross National Product — First Quarter 1972

Statistics Canada has released preliminary estimates of the National Income and Expenditure Accounts which indicate continued growth in the nation's output of goods and services in the first quarter of 1972. Little change is evident in the overall rate of increase in prices and the growth pattern was similar to that in the fourth quarter of 1971. An outstanding feature of the first quarter, was a sharply rising rate of inventory investment.

Gross national product at market prices is estimated to have risen by 2.2 per cent or \$2.1 billion to a level of \$98.7 billion seasonally adjusted at annual rates. This compares with a 2.1 per cent increase in the fourth quarter of last year. After discounting a rise of 1.1 per cent in the overall implicit deflator, the volume of production is shown to have risen by 1.0 per cent — a similar pace of advance as that of 0.8 per cent shown by the revised estimate for the fourth quarter of 1971. The previously released estimate had shown a stronger fourth quarter.

Domestic demand (GNP plus imports less exports) continued to increase and to outpace production, resulting in an unusually large increase in the deficit in the balance of transactions with non-residents. Consumer outlays again posted a good gain, despite a fall in new automobile purchases. Housing construction, which has also been a major sustaining force in previous quarters, continued to advance. An important source of strength in the quarter was the increase in non-farm business inventories, which showed the largest accumulation since the fourth quarter of 1969. On the other hand, fixed capital formation, excluding housing, and exports were sluggish in the first quarter, in line with the perform-

#### Estimates of Population, Canada and Provinces (Thousands)

	Estimated Population		Census June 1, 1971	Per C Increa Sinc Censu
	April 1, 1972	Jan. 1, 1972		
CANADA	21,788	21,731	21,569	1.0
Newfoundland	530	528	522	1.5
Prince Edward Island	113	112	112	0.9
Nova Scotia	793	793	789	0.5
New Brunswick	642	640	335	1.1
Quebec	6,056	6,047	6,028	0.5
ONTARIO	7,800	7,777	7,703	1.3
Manitoba	991	989	988	0.3
Saskatchewan	917	919	926	-1.0
Alberta	1,650	1,644	1,628	1.4
British Columbia	2,241	2,227	2,185	2.6
Yukon	19	19	18	5.6
Northwest Territory	36	36	35	2.9

Source: Statistics Canada, Daily, June 2, 1972.

ance displayed in the second half of 1971. Government current expenditure on goods and services rose at a substantially lower rate than in the previous three quarters.

Consumers increased their outlays on goods and services by 2.1 per cent or \$1,188 million. This represented a little over half of the total increase in the value of production. The rate of increase in the fourth quarter of 1971 was 2.6 per cent. The somewhat lower rate of growth in the first quarter was entirely due to reduced expenditure on new cars, down 8.6 per cent after an exceptionally strong performance in the four previous quarters. Excluding new cars, personal expenditure rose by 2.9 per cent compared with 2.4 per cent in the fourth quarter of 1971.

The current boom in housing construction, which started in mid-1970 and continued throughout 1971 was still evident in the early months of 1972. In the first quarter, the value of work put in place, which reflects new starts during the quarter and the backlog of construction started in previous periods, rose by 5.5 per cent to reach a level of \$5,028 million. The number of units started — in excess of 262,000 — was one of the largest on record. Starts were concentrated in single houses, which have a larger value on average than duplexes and apartments, thus accentuating

the increase in the value of work put in place. The value of investment in single units rose by 17.7 per cent — the largest quarterly increase in the past decade.

#### Population — April 1972

A recent Statistics Canada report estimates the population of Canada as of April 1, 1972 at 21,788,000. This was an increase of 219,000 or one per cent since the June 1, 1971 Census and 57,000 in the first quarter of 1972. Ontario had the largest increase of 97,000 — since the Census and British Columbia the greatest percentage growth — 2.6 per cent. At the present rate of increase the 22,000,000 population level will be reached by January 20, 1973. The basis of these estimates is the population count of the 1971 Census of June 1, 1971. As of noon, June 1, 1972 the estimated population of Canada was 21,810,485.

The elements in population change for the first period since the Census of June 1, 1971 were: one birth every one minute and 17 seconds; one immigrant every four minutes and 29 seconds; one death every three minutes and 17 seconds; one emigrant every nine minutes and 15 seconds; one population increase every two minutes; each day's increase equals 720 persons.



Ontario government's involvement in decision to build a second international port at Pickering has, from the outset, been characterized by two basic concerns. The first concern has been to make certain that the needs of air passengers travelling in and out of the Toronto region would be safely and conveniently cared for by whatever facilities might be built to supplement or replace the existing facilities at Malton. The second concern has been to make certain that any additional facilities would make the maximum possible contribution to the overall well-being of the Toronto-Centred Region, notably its rational and orderly growth and development.

On arriving at the decision announced last March 2nd, the provincial and federal governments co-operated in a long and complex process which consisted basically of examining the broadest conceivable range of options, and then systematically narrowing the options, step by step, down to the most suitable choice. The main body of this paper will relate in greater detail, the decision-making process followed this sequence:

The need for additional air transportation facilities for the Toronto region was thoroughly established by federal studies conducted in the mid-1960's.

The federal government announced its decision to meet these needs by expanding Malton airport.

The federal government revoked this decision because such expansion would cause much disruption of the surrounding community. Assured that Malton would not be expanded, the provincial government introduced certain land-use controls over the surrounding area, to ensure that its growth and development from then on would be compatible with Malton's operations.

A federal-provincial task force began searching for a site that would become the location of the major international airport serving Toronto.

The search was narrowed down from many sites to four sites, and the four were analysed in detail and compared with Malton.

Studying these analyses, the two governments decided that none of the four sites met the necessary criteria already laid down.

Consequently, the basic problem was renewed, the original terms of reference abandoned, and the task force began searching for a site to complement

Malton in a two-airport or multi-airport system.

8. Within these new terms of reference, two "new" sites (Pickering and Beverly) were identified and carefully compared.

9. The Pickering site alone was found to satisfy all technical and other criteria, including the potential to further the objectives of the Toronto-Centred Region plan.

10. The choice of the Pickering site was announced simultaneously by the two governments.

This paper does not purport to relate the history of that decision in its entire detail. Rather, it is intended to complement and interpret the technical reports and other documents which were written at various stages of the decision-making process.

Although this process was thorough and logical, the complexities of the project were such that, in many points in time, several studies and processes were proceeding simultaneously and were having some influence on each other. For instance, while one provincial group was producing the proposals contained in "Design for Development: The Toronto-Centred Region", a separate provincial team concerned specifically with the location of a new airport was compiling a 1970 submission to the federal government. Each team, however, was aware of the other's findings, and the Toronto-Centred Region report influenced the content of the airport submission, even though the latter, as it happened, appeared a month before the former.

In spite of many such simultaneous or overlapping studies, the history of the airport decision can be related as follows:

As a result of a study begun in 1966, the federal government announced in 1967 that it intended to expand Malton airport to meet the future air transportation needs of the Toronto area.

In December 1968, the federal government decided that the proposed major expansion of Malton airport to accommodate traffic to the mid-1980's and beyond was unacceptable, in view of the large-scale disruption that such expansion would cause. It was demonstrated that some 35,000 people were already affected by noise from flight operations and that the proposed expansion of Malton would subject an additional 35,000 people in existing residential communities to this noise.

Assured that Malton would not be expanded, the Ontario government introduced

land-use controls in the noise area to make sure that any growth around the airport would be compatible with flight operations from Malton as it existed.

In announcing the controls, the Honourable W. Darcy McKeough, then Minister of Municipal Affairs, said in a public statement that they represented "the first comprehensive attempt by any jurisdiction in North America to ensure that the utilization of lands in the vicinity of an airport would be compatible with the high noise levels generated by aircraft operations". Since these controls were announced, some 25,000 people have moved into areas which are not controlled and which would be affected by noise if Malton were expanded.

Soon after, a federal-provincial task force was formed to seek an alternative site as the major airport for Toronto, to be operative about 1980. Malton would be confined to handling its existing volume of traffic.

Federal experts initiated this search by identifying 59 sites within a 50-mile radius of Toronto. Purposely, it was a rough first list, designed to identify any site that could become a major six-runway airfield.

Next, the task force set about reducing this list to a few sites, eliminating the others on grounds of safety, operational considerations involving navigational aids, aircraft and air traffic control equipment, ground access problems, existing flight paths, weather, disturbance to heavily built-up urban areas, and so on.

By this process, the list was reduced to four sites: Lake Simcoe, Lake Scugog, Campbellville (Guelph-Kitchener) and Orangeville, which were to be analysed in depth. As part of this analysis, the Ontario government commissioned a study entitled, "Regional Impact of a New International Airport for Toronto". Published in March, 1970 for internal government use, this report was the work of a consultant, Gerald Hodge, who had been commissioned by the government and had considerable support from the province's regional development staff in preparing the report.

The Hodge Report, like several that followed it, is too technical and too detailed for brief summary here. However, two significant points about it should be noted. First, Hodge forecast the annual flow of air passengers through Toronto would reach 54 million by the year 2000 (a figure roughly in line with the federal estimate). Experts from both governments agreed that this



would be far too many passengers to be served by Malton's facilities, which were then handling 5.3 million per year.

Secondly, Hodge set out his views on the pros and cons of the four sites then under consideration as eventual replacements for Malton airport and rated Orangeville and Lake Scugog highest.

The Hodge study, combined with the findings of three other studies commissioned by the federal government, were summarized in a provincial document of April 1970 entitled, "Submission to the Government of Canada in Respect of the Location of the Second International Airport for the Toronto Region".

As this report said, "None of these studies were (sic) required to provide conclusions or recommendations for any particular site but only to provide a detailed data analysis of each site's potential . . ."

The report, dated April, 1970, set out criteria designed to facilitate consideration of the options and to enable policy decisions to be made on the basis of comparisons between sites.

Using the four technical studies as the basis of its judgment, this report made these observations:

*Costs to various levels of government:* Lake Simcoe would involve by far the highest cost. Among the other three sites there would be "no significant difference".

*Costs to users of the air terminal:* Campbellville (i.e. Guelph-Kitchener) would cost considerably less than the others — to the extent of \$1 billion over 30 years.

*Social, ecological and environmental disruption:* Lake Simcoe would present "significant destructive influences" and would be "particularly harmful to the recreational potential of the Toronto region". There were "no significant differences" between the other three, Campbellville (Guelph-Kitchener) was the poorest choice of these three.

*Benefits to the region's long-range development:* Lake Scugog and Orangeville sites were best. Campbellville had "some significant disadvantages"

This report, offering such evaluation rather than a firm recommendation, said that there had to be a trade-off between alternative advantages and that the choice of site would depend on a policy decision on how much weight would be given to various criteria.

In mid-1970, federal-provincial discus-

sions at the ministerial level intensified. From the federal point of view, none of the sites was technically excellent and some had significant drawbacks. Meanwhile, the Ontario government had misgivings about the same sites in relation to its Toronto-Centred Region plan. In its plan, entitled, "Design for Development: The Toronto-Centred Region",<sup>2</sup> the Ontario government called for measures to encourage a relatively heavier increase in the population to the east of the city. Observing that "Malton will continue to exert an enormous influence on the shape of the region", the report added:

"The location of a new international airport to service southwestern Ontario would be of most crucial significance to the future spatial pattern of the Toronto-Centred Region. An airport will bring with it, into an immediate impact area, in excess of 120,000 people with public and private investment in excess of \$3 billion. Furthermore, since a new airport will require highly efficient transportation routes between itself and Malton, a new corridor for potential development will be created. The integrity of the development concept requires that a site be chosen which does not add such a powerful magnet for development in a location which conflicts with strategic components of the plan."

Because of the doubts being expressed about all four external sites, an internal review was taken in the Ontario government of the feasibility of having Malton handle all air traffic until the year 2000. Population estimates for the area were brought up to date and studies were conducted of the problems of expanding the airport ("Toronto Airport Location — Proposed Malton Expansion") and of the associated question of providing sufficient ground transportation to serve the airport.

Within the limits of its own assumptions, the study on expansion of the airport appeared to offer a practical solution to the whole problem. It showed, to no one's surprise, that expanding Malton would cost 35 to 65 per cent less than building a major six-runway airport at any of the other four potential sites. (The Pickering concept, far less expensive than those four other sites, had not yet been costed out.) "The savings in primary capital costs alone are \$400 million," the report said. It conceded that Malton would generate more ground traffic than could be handled by all highways then

existing or planned, and that the highways still in the planning stage were at the practical limit of 16 lanes. However, the report suggested that the ground transportation problem could be solved by a system of terminals away from the airport site. This could be connected to the airport by a rapid-transit system built especially for purpose.

Conceding another set of major difficulties that expansion would bring about, the report noted that "the political history of expansion of this site is such as to suggest that further encroachment on urban land, further increases in noise and air pollution and further risk of safety hazards is socially unacceptable in this area." (What it may have added was that by then the unrestricted area around Malton was even more densely built up than it had been when objection to expansion were voiced in 1968.)

To overcome these "socially unacceptable" difficulties, the report warned that stringent technical controls would be needed to prevent any further spread of noise and pollution, as well as "strong control of zoning and subdivision approvals" to hold population down to existing target figures.

The report also conceded that expansion of Malton would encourage the very population shift that the Toronto-Centred Region plan was designed to reverse; but it argued that strong government controls could restrain this trend.

Ontario government leaders read the report and decided that its proposition was based on too many risky assumptions. They assumed that a number of major untested and undeveloped technological advances in rapid transit, noise abatement and pollution control would all become practical realities by the time expansion was complete.

If that assumption proved wrong, thousands of people who had recently moved to the Malton area, on the assurance that the airport's adverse effects would not touch them, would suffer from noise and air pollution.

The report also assumed that the measures proposed by the Toronto-Centred Region plan could be modified drastically enough to overcome the added impetus of a population build-up west of the city.

Ontario government leaders looked at those assumptions and rejected the airport's proposals.

Now the search for a solution to the airport problem had reached a point where

<sup>2</sup>Ontario Economic Review, July-August 1970, Vol. 8, No. 4, pp. 3-13.



one of the alternatives at hand were considered satisfactory.

It was therefore decided to review the alternatives and see what modifications might be considered. A Summary Report on Status of Airport Planning was prepared for the Ontario Cabinet and this outlined the following options:

Expand Malton only.

Build a major airport elsewhere and let Malton handle only the short-haul flights.

Expand Malton, purchase a landbank at one of the other sites and develop the later into an airport only if Malton proves unable to contain its noise and air pollution.

Expand Malton and develop a system of regional airports with Malton having a central, long-haul role.

Close Malton in the early 1980's and meanwhile develop a new airport elsewhere.

The report recommended a combination of these alternatives involving a moderate expansion of Malton beyond the current Phase II, together with the development of a major eastern airport site as soon as possible.

The approval of this decision meant there was to be not just a single airport but a system of airports. The second airport, wherever it might be, did not have to meet the stringent requirements set out for the original four sites. The task force was then able to recommend consideration of two new sites: Beverly Township, in the southwestern sector of the region, and Pickering Township, in the north. Federal authorities looked at the new tenders and agreed that both were technically feasible for airport operations.

The selection of the two new sites developed logically from the studies of the previous three years, and from the new criteria. It was most desirable to pick sites that fitted into the regional transportation patterns and were strategically placed to serve the market. None of the original four sites met these new requirements.

In addition, either of the two new sites would be less costly to build and less costly to operate than any of the original four.

In October 1971, a provincial report entitled "Review of the Proposed Airport Sites

E and F—Regional Development Plan"<sup>3</sup> evaluated the two sites according to the impact they would have on the Toronto-Centred Region.

It warned that, partly because of "the power of an airport to focus growth", selection of the Beverly site would "detract from the effectiveness of government measures to stimulate growth and services east of Toronto" and might cause problems of absorbing growth in the nearest cities.

The report suggested that if inauguration of a major western airport could not be prevented outright, it should at least be delayed until development east of Toronto had gained momentum.

The Pickering site, the report went on, "on the other hand partly satisfies the requirement for general economic stimulus in the eastern corridor, but falls short to an extent which may have the effect of stimulating growth in and adjacent to eastern Metropolitan Toronto, rather than in and near Oshawa, as desired".

The report also singled out noise and ground transportation as potential problems in Pickering. But in its summation, the report left no doubt that Pickering was considered by far the better choice for the airport site. In a numerical summary of the criteria considered vital, Pickering scored seven points to Beverly's four.

Meanwhile, a report called "Ground Transportation Review of Sites E and F" suggested that local transportation problems at the southwestern site were not nearly so severe as at the northeastern site. However, the northeastern site, it said, provided the greatest capability for both highway and mass transit access. A major transportation facility for the southwestern corridor would be much more difficult to accommodate.

Environmentally, there were pluses and minuses on both sides, but not evenly so, as a report from the Ontario Department (now Ministry) of the Environment showed, in February 1972.

This report, entitled, "Proposed Toronto Airport II: Environmental Impact Study" only rated the Beverly Township site a more desirable choice for the airport on one count: the soil there is less fertile than in Pickering; hence soil damage in Beverly would be a less significant loss. But on 16 other en-

vironmental points, Pickering proved the better choice. Beverly's farms are more modern and successful than Pickering's—many of which are vacant or in need of repair. As far as the effects on drainage systems, water tables and water quality are concerned, Pickering would either suffer less—or have less to lose. The same is true of the impact of natural vegetation (Pickering has no natural woodlots; Beverly has), on fishing (many Pickering streams are posted against it anyway), on hunting (Pickering has no game animals to speak of) and on ecological inter-relationships (Pickering's are less complex, hence less susceptible to disruption).

With such strong environmental arguments going for it, and with the added prospect of giving the Toronto-Centred Region the right economic stimulation in the right place, Pickering became the choice—not just for the airport itself but also for an adjacent community for which the province now plans a population of 150,000 to 200,000.

Prior to the determination of the new Pickering airport, the Toronto-Centred Region plan called for development of a number of new communities in a northeastern tier paralleling the lakeshore. Cedarwood, Brock and Audley were proposed for development starting in the 1980's. This growth strategy required transportation corridors, transit facilities, water, sewerage and other community services.

The development of an airport complementary to Malton, at the North Pickering site, will not create new unplanned urban development. The decision did require some modification of the original arrangement of the communities and some changes in the timing of services. North Pickering Community takes into consideration the possible runway alignments and the noise from the airport. The opportunity it provides is being taken to bring about a more exciting and attractive city. The new airport provides the stimulus for development in this area and at the same time assists in diminishing growth pressures west of Toronto.

These changes do not represent a departure from the growth strategy for the Toronto-Centred Region. The decision is a major step in its implementation.

<sup>3</sup>See Appendix.



## TCR STRATEGIES USED TO REVIEW PROPOSED AIRPORT SITES E AND F<sup>4</sup>

One of the main goals of the Toronto-Centred Region Concept is to "increase the level of opportunity" for residents of the eastern and northern sectors of the Region. In this sense "opportunity" is the notion of access to medium and high order activities, services and functions.

Towards achieving this goal — "increase the level of opportunity" — the concept involves the relevant strategies of:

**Strategy 1** — *Deflection to and stimulation of growth extending from the boundary of Metropolitan Toronto to Bowmanville, focussed on Oshawa.* Growth of the Toronto Region has tended to be westward and congested, and has not proceeded at the same tempo in the underdeveloped eastern corridor. Comparatively speaking the smaller centres of the eastern corridor do not provide the same level of opportunity as is available in the western corridor.

**Strategy 2** — *Linearity which seeks as far as possible to align urban places and activity nodes along a series of more or less straight paths to take maximum advantage of super-imposed demand for transportation and services.* The linear arrangement would generate sufficient traffic to make workable a highly sophisticated transportation system, thereby increasing the level of aggregate opportunity within the system of cities along this spine.

**Strategy 3** — *Decentralization to develop peripheral urban centres such as Port Hope/Cobourg.* Growth will increase the range of services available in these centres and increase the level of opportunity to their hinterland.

## IMPACT ANALYSIS OF AIRPORT SITES E AND F

Each of the sites is evaluated from the point of view of its impact upon achievement of the above strategies.

### Site F (Brock City)

The selection of the site effectively preempts the sub-regional centre of Brock City from the two-tiered system of cities. The loss of this centre does not substantially alter the concept; however its selection does have varying degrees of impact upon the three strategies:

**Strategy 1** — The location of the Airport at site F would generally be a positive factor in the stimulation of growth in the eastern corridor. However, the magnitude of this stimulation is tempered as the selected site does not assist fully in the establishment of the dominance of Oshawa. It is anticipated the primary residential impact will fall on the adjoining centres of Cedarwood, Pickering, Audley and Ajax and the industrial impact on East Metro. As well, the prospect of stimulation of such undesirable Zone 2 centres as Markham and Stouffville (Century City) is raised again.

The airport location at F partly satisfies the requirement for general economic stimulus in the eastern corridor, but falls short to an extent which may have the effect of stimulating growth in and adjacent to Metropolitan Toronto, rather than in and near Oshawa, as desired.

The goal here is to move Oshawa ahead as soon as possible in order to establish quickly the medium and higher order activities there and then subsequently stimulate growth in Ajax, Audley and Cedarwood. If growth is delayed at Oshawa, places like Cedarwood and Audley will establish their affinities with Metropolitan Toronto rather than Oshawa. In this regard, Site B (Lake Scugog) is acceptable.

**Strategy 2** — Site F generally supports the notion that all regional generators and attractors should be on line and therefore well interconnected. Site F is acceptable in this regard as long as the transportation interchange between the regional public system and the airport public circulation system is at the southern extremity of the site.

**Strategy 3** — Site F provides more convenient access than Site E for long-haul service for Port Hope/Cobourg and Peterborough/Lindsay. However, it is not as favourable as the combination of Malton and Site B. An airport at Site F, with these user benefits, would positively foster decisions to locate at Port Hope/Cobourg and consequently assist the achievement of Strategy 3.

### Other Observed Constraints and Opportunities

The utilization of Site F will have an effect upon the site locations of six regional activities:

- The site for the new City of Brock will be completely used by the Airport (Brock

City site and Site F are virtually coincident).

- HEPC's proposed 500 K.V. lines on N/S alignment along the west side of Duffins Creek, plus an E/W alignment immediately South of Claremont as well as a proposed transformer site south of Claremont, all would have to be located.
- The C.P.R. Peterboro Subdivision would have to be relocated which may create the opportunity to directly serve Site F. However, a slight northerly relocation of the C.P.R.'s Oshawa Subdivision would more advantageously serve Site F and then would be "on line" of the second principal service-activity spine of Zone 2.
- Would impair public enjoyment of important recreation/conservation elements of the mini-belts separating Cedarwood/Brock/Audley.
- The runways on Site F are positioned such that much of the flight path traverses the Parkway Belt. The proposed south E/W runway would create overflying the proposed second tier Audley City Centre.
- Added stimulation by the Airport could cause a northerly migration of the Zone 2 boundary at Brock, Audley, etc.

### Site E

Site E, which is located west of Hamilton, is generally compatible with plans for structuring the western sector of TCR. However, it detracts from expansion policies for the eastern corridor.

**Strategy 1** — As stated above, Site E competes directly with the provincial strategy to stimulate growth within the eastern corridor. Additional growth potential here aggravates the servicing problems caused by high growth rates to the west of Metropolitan Toronto. It diminishes the opportunity for achieving a more balanced growth between areas east and west of Metropolitan Toronto. As far as strategy achievement is concerned, capital spent for facilities in the eastern corridor is more productive.

**Strategy 2** — Site E can be serviced by an extension of the principal spine of Zone 2, rendering it fully "on line". In this regard, Site E is a better westerly candidate than either Sites C or D (Campbellville or Orangeville).

**Strategy 3** — The stimulus of an airport is not needed in the western area, as it

<sup>4</sup>Extract from "Review of Proposed Airport Sites E and F — Regional Development Plan" tabled in the Ontario Legislature by the Hon. W. D. McKeough, June 6, 1972.



ilton and Kitchener/Waterloo are already beyond the lower threshold of self-initiating development.

potentially, the westerly extension of the second tier spine intersects with the evolving Kitchener/Waterloo/Hamilton/St. Catharines spine at Site E, creating a location with optimum accessibility qualities. Development gravitate to this location and thus commensurate with the location of higher order activities at Hamilton, a TCR regional-terminal node.

#### Observed Constraints and Opportunities

Utilization of Site E will have an effect on the site location of three regional activities.

A major positive consideration of Site E is that it is compatible with plans for physical structuring of the western sector of the TCR.

The Niagara Escarpment is an effective device to delimit urban development. Site E, within close proximity to the Escarpment, and sheltering behind it, reduces the chances for a repetition of the Etobicoke experience.

It is possible that Site E is in conflict with EPC's plans for a 500 K.V. Line connecting Nanticoke to the Galt/Guelph/Kitchener/Waterloo complex.

#### Comparative Summary of Site Impact upon TCR Strategies

Strategy	Site	E (West of Hamilton)	F (Brock City)
1 Eastern Stimulation		1	3
2 Linearity		2	2
3 Peripheral Centres		1	2
Total		4	7

LEGEND: Weights To Subjectively Measure Strategy Compatibility

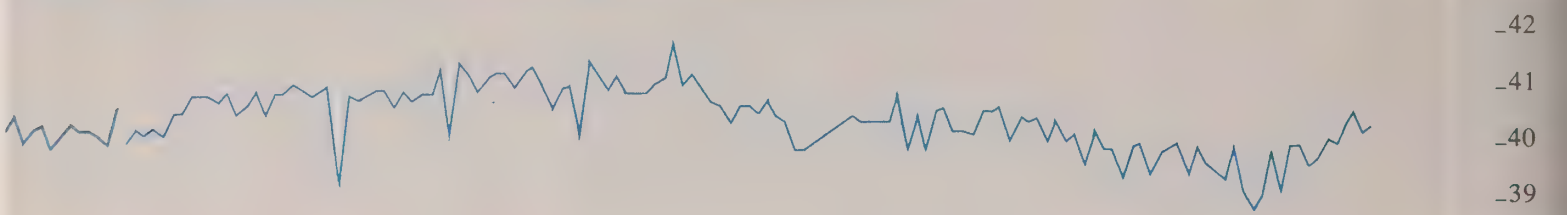
Good - 3  
Fair - 2  
Poor - 1

Based on the above subjective evaluation, Site F best complements the three selected strategies which together help achieve the primary TCR goal to increase the level of opportunity for future residents of the eastern and northern corridors.

# Selected Economic Indicators

## Leading Indicators

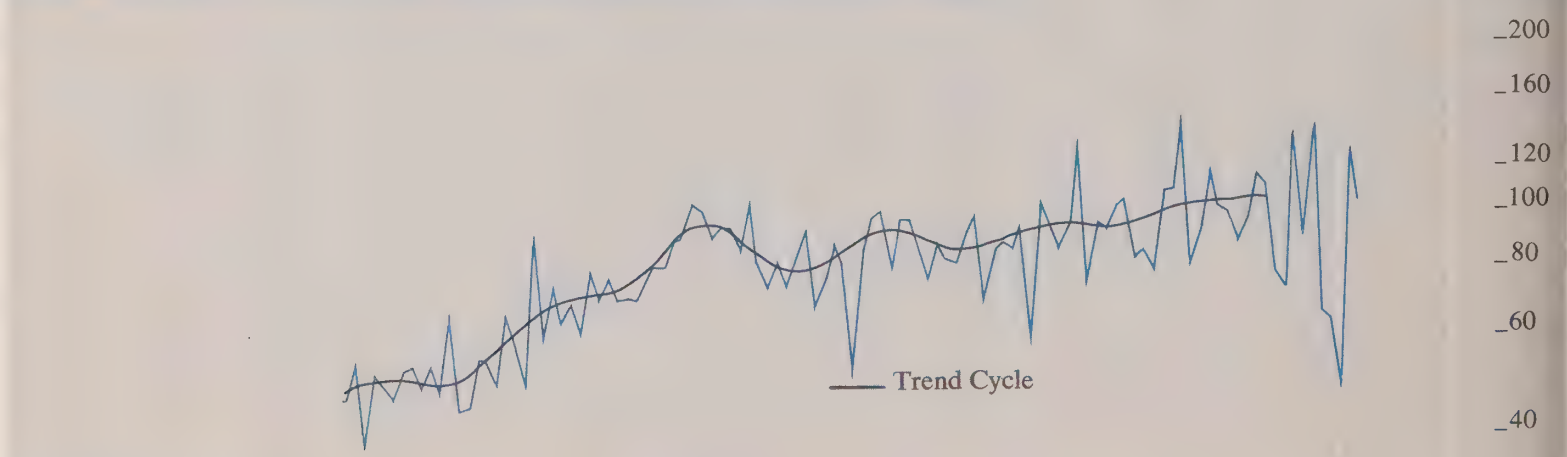
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



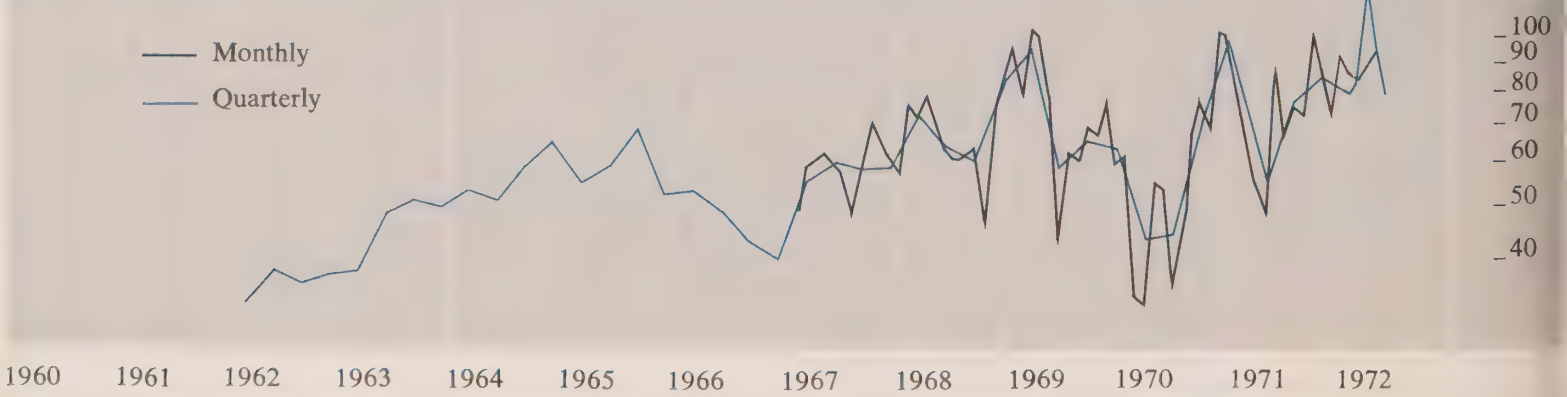
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)





## Leading Indicators

**Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

Scale L1  
\$ Billion  
\_35  
\_30  
\_25  
\_20  
\_15

**Ontario Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Scale L2  
Index  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

## Incidental and Lagging Indicators

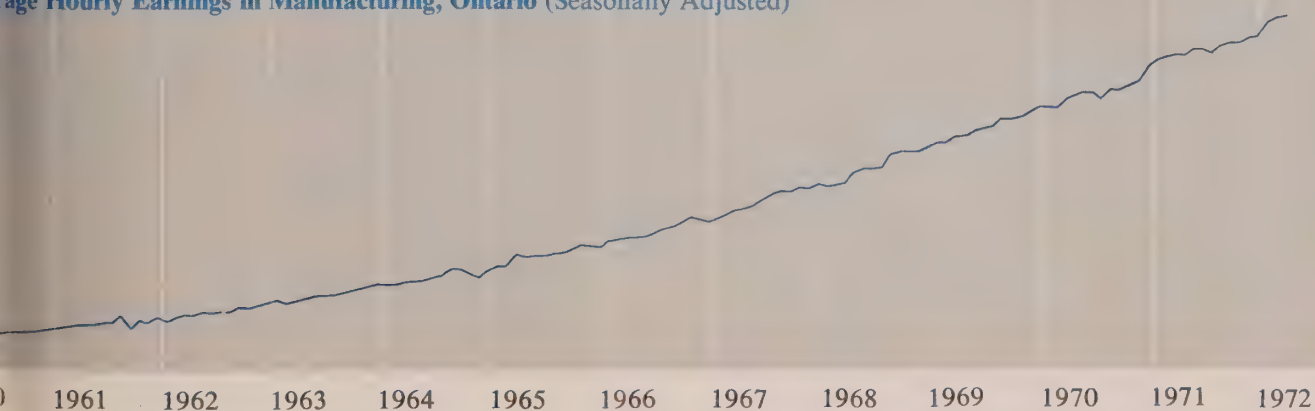
**Canada's National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

Scale L1  
\$ Billion  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Scale L1  
Dollars  
\_3.50  
\_3.00  
\_2.50  
\_2.00



# Coincidental and Lagging Indicators

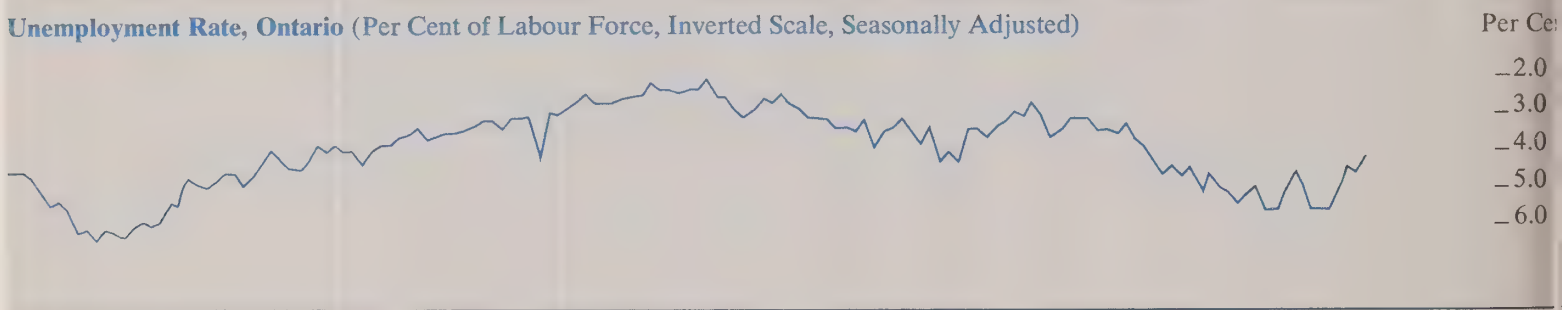
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



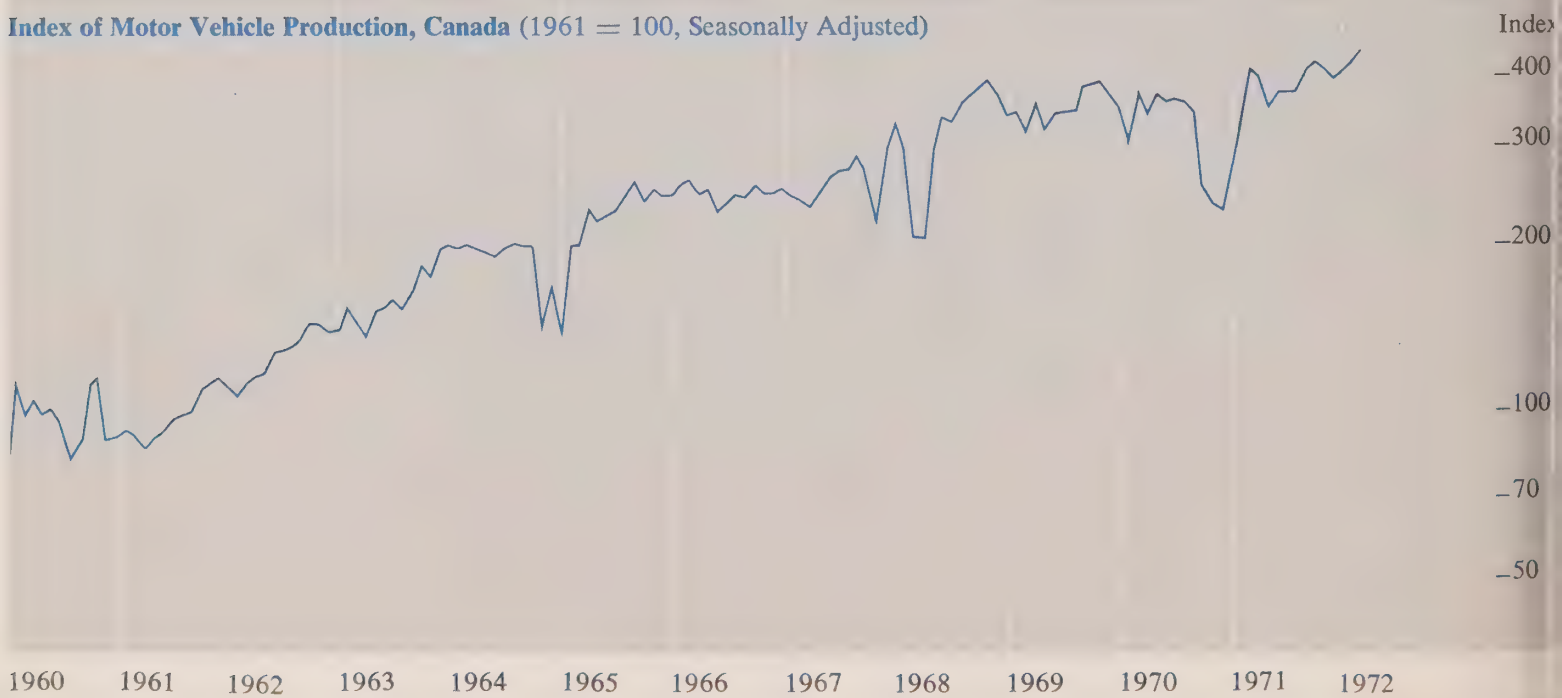
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)







# Ontario Economic Review Feature Articles

1964		1965 (continued)	
Jan.	(Annual Review)	Dec.	(Annual Review)
Feb.	Tobacco — Ontario's Major Cash Crop	<b>1966</b>	
March	Canada's Requirements for New Business Machinery and Equipment from 1965 to 1975	Jan.-Feb.	Opportunity through On-the-Job Training
April	Some Impressions Arising from the First Year of Operation of the Ontario Development Agency	March	The Development of Ontario's Textile Industry
May	Ontario Labour Markets, 1953-1963	April	"The New Economics" and the Province of Ontario
June	The Approach of Regional Analysis	May-June	Progress Under the Automotive Free Trade Agreement: Some Comments
July	The Niagara Economic Region: Present Characteristics and Prospects of the Future	July	Ontario's New Housing Program
Aug.	The Development of Forestry Policy	Aug.-Sept.	Economic Education
Sept.	An Index of Economic Health for Ontario Counties and Districts	Oct.-Nov.	The Distribution of Personal Income in Ontario and the Ten Economic Regions
Oct.	Preliminary Indexes of Production in Ontario	Dec.	Canada and the U.S. Guidelines
Nov.	A Pilot Study on Regional Labour Income in Ontario	<b>1967</b>	
Dec.	The Growth and Development of Primary Iron and Steel in Ontario	Jan.-Feb.	(Annual Review)
<b>1965</b>		Mar.-Apr.	Fertility and Population Growth in Ontario
Jan.	Oil and Natural Gas in Ontario	May-June	Soybeans in Ontario: Production, Utilization and Prospects
Feb.	Ontario Regional Population Projections 1961-1986	July-Aug.	Population Migration to and from Ontario
March	Significant Economic Changes in Agriculture	Sept.-Oct.	Towards a Theory of Provincial-Municipal Grants
April	The Growth and Development of the Furniture Industry in Ontario	Nov.-Dec.	Ontario's Demand for Industrial and Agricultural Machinery to 1976
May	The Institutional Investor and the Securities Market	<b>1968</b>	
June	The Growth and Development of the Motor Vehicle Industry in Ontario	Jan.-Feb.	The Economy in 1967
July	Perspective on Recent Price Movements in Canada	Mar.-Apr.	Trade Liberalization and the Forest Industries
Aug.	The Background of Federal Unconditional Grants to the Provinces 1867-1887	May-June	Potato Marketing in Ontario
Sept.	A Progress Report on the Economic Atlas of Ontario	July-Aug.	Budgetary Constraints to Policy Development
Oct.	Educational Achievement Levels in Ontario	Sept.-Oct.	The Pattern of Consumer Expenditure at Provincial and Regional Level
Nov.	Concentration and Competition in Ontario's Fluid Milk Industry	Nov.-Dec.	Development of Information Flows for Economic and Financial Policy Formulation
		<b>1969</b>	
		Jan.-Feb.	Preliminary Population Projections for Ontario 1971-1991
		Mar.-Apr.	The Solemnization of an Institutional Marriage (or the joining of the 'Treasury' with 'Economics')
		May-June	The Reform of Taxation and Government Structure in Ontario
		July-Aug.	St. Lawrence Seaway — Impact on Ontario
		Sept.-Oct.	Air Pollution and the Utilization of Natural Gas in Automobile Vehicles
		Nov.-Dec.	An Analysis of Population Growth Trends in Ontario
		<b>1970</b>	
		Jan.-Feb.	The Input/Output Structure of the Ontario Economy
		Mar.-Apr.	Economic Aspects of Environmental Quality for Ontario
		May-June	The Public Sector and Economic Policy
		July-Aug.	Design for Development: The Toronto-Centred Region
		Sept.-Oct.	Geocoding — A Technique in the Development of Urban Information Systems
		Nov.-Dec.	The Development of Ontario's Economic Accounts
		<b>1971</b>	
		Jan.-Feb.	Tax Reform and Small Business
		March	Special Supplement — An Econometric Model for the Ontario Economy
		Mar.-Apr.	Price Changes 1961-1970: An Economic Analysis
		May-June	An Analysis of Fertility Trends in Ontario
		July-Aug.	Provincial-Municipal Reform: A Progress Report
		Sept.-Oct.	Ontario Economic Accounts: A Dual Approach to the Measurement of Provincial Product
		Nov.-Dec.	Federal and Ontario Fiscal Policy in 1970 and 1971
		<b>1972</b>	
		Jan.-Feb.	The Input-Output Structure of the Niagara Region
		March	Special Supplement — Section on Characteristics of the Ontario Structure of Production
		Mar.-Apr.	Ontario's Property Tax Credit Plan
		May-June	The Ontario Government and the Pickering Airport Site









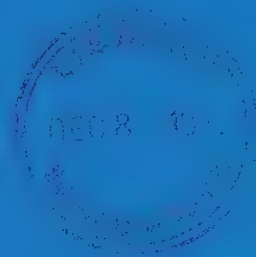


# Ontario Economic Review

September/October 1972  
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Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

September/October 1972  
Volume 10, Number 4

## The Ontario Economy

### An Analysis of Mortality Patterns in Ontario

T. R. Barratt, *Demographer*

Ministry of Treasury, Economics and Intergovernmental Affairs

## Selected Economic Indicators

2

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Government of Ontario

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*Treasurer of Ontario and  
Minister of Economics and  
Intergovernmental Affairs*

H. Ian Macdonald  
*Deputy Minister*

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#### About the Review

The feature article of the September/October edition examines some of the more significant aspects of mortality in Ontario. Mortality rates for different age and sex groups are established and are compared on a province-wide basis, and in some instances, on an international basis.

Over the last decade, Ontario and Canada have experienced steadily declining death rates, while some industrial nations have witnessed little improvement in mortality levels. In Ontario, declines in the rate of infant and maternal mortality, in particular, have been dramatic.

In the last fifty years, improvement in female mortality far outstripped that for males. For both males and females, however, heart disease remains the number one cause of death, and continues to claim an ever increasing proportion of lives.

This article was prepared by T. R. Barratt in the Economic Analysis Branch of the Office for Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs.

#### Indicator Charts, Pages 22-24

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 22-24 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L 1' and 'L 2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *This applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## Growth of the Canadian Economy in the Second Quarter of 1972

Preliminary estimates of the National Income and Expenditure Accounts for the second quarter of 1972, recently published by Statistics Canada, indicate an increase in the production of goods and services, characterized by strengthened domestic and foreign demand and by a moderation in the overall rate of price increase.

Canada's gross national product, seasonally adjusted at annual rates, rose by \$2.9 billion in the second quarter to reach a level of \$102 billion, an increase of 3.0 per cent over the first quarter. The rise in the implicit price index of GNP, slowed to 0.8 per cent, compared with the 1.4 per cent increase witnessed in the previous quarter. After discounting that part of the increase in the value of goods and services due to higher prices, GNP rose by 2.1 per cent in the second quarter. The gain in real output in the first quarter was 1.2 per cent.

The stimulus to production in the second quarter was largely provided by personal expenditure on consumer goods and services and by foreign trade, as the rate of growth of exports outpaced imports, thus reversing the trend shown in the first quarter. Large increases in business spending on machinery and equipment and in government capital expenditure, contributed to a lesser degree, but more than offset the dull performance in construction.

Since the last quarter of 1971, real GNP has been rising at a quarterly rate of 1.6 per cent, about the same rate as during 1971. The continuing strong gain in consumer expenditure, which rose at a quarterly rate of 7 per cent in the six-month period, was a major force behind the expansion. The second quarter increase of \$1.9 billion was one of the largest in recent years and brought consumer expenditure to a level of \$59.3 billion.

Personal income in the second quarter rose by 4.3 per cent, seasonally adjusted — the largest percentage gain in many years — while personal disposable income grew even faster, by 5.5 per cent.

Consumer demand was buoyed by a billion dollar increase in transfer payments, mostly in the form of old age pensions and employment insurance benefits. The acceleration in the rate of consumer spending is entirely due to an upsurge of 4.2 per

cent in expenditure on goods, twice the first quarter rate of increase. Spending on new automobiles was particularly strong, up by almost 18 per cent after an 8.6 per cent decline in the first quarter. Business investment, with expenditure on machinery and equipment rising by 5.7 per cent in the second quarter, contributed appreciably to the economic growth achieved during the quarter.

The substantial improvement in Canada's current account balance contributed significantly to the strength of the economy as measured by GNP. Quarterly Estimates of the Canadian Balance of International Payments for the second quarter of 1972, recently released by Statistics Canada, indicate that the seasonally adjusted current account deficit fell to \$17 million from \$325 million in the first quarter. This improvement in the current account balance was largely due to the increase in the merchandise trade surplus, which at \$429 million, amounted to some 2.5 times that in the first quarter.

Exports, seasonally adjusted, rose by over 8 per cent to \$4,982 million, while imports went up by 3 per cent to \$4,553 million. The strike at St. Lawrence ports in May and June does not appear to have affected significantly the overall level of exports and imports in the quarter. The rate of growth of imports in the second quarter was the lowest since the decline recorded in the fourth quarter of 1970 when trade in automotive products was substantially affected by strikes.

Capital movements between Canada and other countries in the second quarter of 1972, resulted in a net capital inflow of \$395 million, down \$135 million from the first quarter capital inflow of \$530 million. Canada's net official monetary assets totalled U.S. \$6,218 million at June 30, 1972, an increase of U.S. \$470 million over the quarter. Of this change, U.S. \$134 million occurred as a result of the revaluation of the stock of Canada's gold-based assets in May. These assets include gold, special drawing rights and Canada's reserve position in the International Monetary Fund. Reserves, therefore, rose by U.S. \$336 million apart from the revaluation of existing holdings.

The spot value of the Canadian dollar on foreign exchange markets rose markedly in the quarter, reaching a new 10-year peak in

late June as the United States dollar dipped to 97.41 Canadian cents from a mid-April value of 99.81 Canadian cents. The spot value of the United States dollar closed the quarter at 98.47 Canadian cents. The pound sterling dropped sharply in relation to the Canadian dollar following the British government's decision to allow the pound to float.

Sales of new motor vehicles in August, up almost 20 per cent compared with the same month a year ago, reached a level of 72,800 units. Recent statistics released by Statistics Canada, show that the value of sales amounted to \$291.9 million, 33.1 per cent higher than in August 1971 when 60,841 vehicles were sold.

The number of passenger cars sold increased by 14 per cent, with commercial vehicles increasing 47.1 per cent, while the dollar value of sales increased by 23 per cent and 65.2 per cent respectively. A notable feature of the August performance was that it was the first time in several years that sales of imported passenger cars had declined, when compared with the same month in the previous year. Although the sales value of foreign cars increased by 6.4 per cent, the number of vehicles sold fell by 4.2 per cent from 18,704 to 17,911. The number of Canadian and U.S. passenger cars sold rose by 24.8 per cent, from 31,800 to 39,682, representing a 30.2 per cent increase in the value of sales.

Figures for the first eight months of this year show new vehicle sales to have risen by 16 per cent over the corresponding period last year; passenger car sales recorded a 12.3 per cent increase and commercial vehicles a 34.2 per cent increase.

Neither North American manufacturers nor their foreign competitors were able to increase their share of the passenger car market. North American cars accounted for 75.2 per cent of the domestic market with the remaining 24.8 per cent taken up by cars manufactured abroad.

The average price paid for the North American car rose by 3.7 per cent, from \$3,732 to \$3,869. Foreign cars also cost more to buy, the average price rising from \$2,671 to \$2,977 — a rise of 11.5 per cent — thereby increasing their share of the market, in terms of dollars, from 19.1 per cent to 20.2 per cent.

# An Analysis of Mortality Patterns in Ontario

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This study presents a review of the more significant aspects of mortality in Ontario. Its purpose is to place provincial mortality patterns within an international framework and to provide an historical perspective for a variety of mortality data. The data cover primarily the last decade, however in some instances, mortality trends have been traced back to 1921.

Statistics shown were, in the main, calculated by the Economic Analysis Branch, Ministry of Treasury, Economics and Intergovernmental Affairs, and are based on Census of Canada and Ontario Vital Statistics reports. Some material was taken directly from these sources as well as from Statistics Canada Vital Statistics publications. Data sources other than these are identified in the body of the report.

It should be pointed out that statistics shown for other than census years are based on population estimates and not on actual counts.

## I - MORTALITY LEVELS

### International Crude Death Rates

Crude death rates (deaths per 1,000 population) have shown varying patterns over the last decade. It can be seen from Table I that in industrialized countries, death rates have declined in about half the cases and increased in the other.

Israel, which had the lowest rate in 1961 (5.8 per 1,000 population) showed the greatest percentage increase (20.7) but still had the second lowest death rate in 1969. Canada ranked third in 1969 with Ontario experiencing a rate slightly higher than the national average. The rates for both Canada and Ontario have declined steadily over the period, whereas the United Kingdom, Germany and France which had the highest rates in 1969, have shown no significant improvement since 1961.

It is difficult to estimate the effects of changing age distributions on crude rates. It appears that many of the increasing rates, especially in Israel, could be attributed to an aging population. Without age specific data, however, concrete conclusions cannot be drawn.

### The Ontario Crude Death Rate

The pattern of crude death rates for Ontario from 1921 to 1970 is outlined in Table A<sup>1</sup>. Rates declined from 11.8 deaths per 1,000 population in 1921 to a level of 7.4 in 1970 — a decline of 37 per cent. Female rates showed a decrease of 45 per cent (11.4 to 6.3), and for males a decrease of 30 per cent (12.2 to 8.5). Death rates for the total population declined steadily from 11.8 in 1921 to 9.9 in 1934, increased during the period 1935 to 1947, whereupon they have steadily fallen to their present level.

Between 1921 and 1933 the male death rate varied from a high of 12.2 to a low of 10.3. It continued to fluctuate up to 1933 thereafter it steadily declined. The female rate reached a high of 11.5 in 1923, dropped from 10.5 in 1930 to 9.8 in 1931, and in the following year to 10.1. From 1936 to the present, rates have continued to decrease.

### Age Specific Rates

Although crude rates give a general picture of mortality trends, they are affected not only by changing mortality patterns, but also by shifts in the age distribution of the population. It is advantageous, therefore, to examine age specific data in order to eliminate the effect of age distribution. Table B<sup>1</sup> traces age and sex-specific patterns of mortality from 1921 to 1970 by five-year age groups.

This table clearly shows that the greatest decline in mortality occurred in age group 0 - 4. In the case of males, the rate dropped from 31.8 deaths per 1,000 population in 1921 to 4.5 in 1970 — a drop of almost 86 per cent. Similarly, the female rate plunged from 24.7 to 3.4 per 1,000 population during the same period — a drop of 86 per cent.

For male rates, improvements of 45 per cent or more occurred in all age groups up to age 44. Thereafter, declines were far less dramatic. Age group 65 - 69 actually showed an increase in mortality from 34.4 deaths per 1,000 in 1921 to 38.8 in 1970. Females, on the other hand, showed a significant decline in mortality in all age groups over the same period. For age group 65 - 69, for example, the female rate declined by 47 per cent, while the male rate increased.

The same table also provides the geometric mean of the age specific rates, the best single numeric indicator of mortality. The male geometric mean fell from 13.1 in 1921 to 7.0 in 1970 — a drop of 46 per cent. The female mean declined even more rapidly, from 12.9 in 1921 to 3.9 in 1970 — a decrease of almost 70 per cent.

Thus, over the period, improvements in female mortality patterns far outstripped those for males. While male mortality was only 10 per cent greater than female in 1921 (13.1 vs 12.9), it is now almost 80 per cent greater. In particular, males over the age of 44 have shown very little improvement in mortality during the last 40 years. It is in this segment of the population that effort must be directed if male mortality is to be reduced.

Table I—Crude Death Rates, Selected Countries, 1961-1970

Country	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Percent Change 1961-1970
Canada	7.7	7.7	7.8	7.6	7.6	7.5	7.4	7.4	7.3	7.3	- 5.2
Ontario	8.2	8.2	8.3	7.9	8.0	7.8	7.7	7.6	7.5	7.4	- 9.8
U.S.A.	9.3	9.5	9.6	9.4	9.4	9.5	9.4	9.7	9.5*	9.4*	+ 1.1
U.S.S.R.	7.2	7.5	7.2	6.9	7.3	7.3	7.6	7.7	8.1	8.2*	+13.9
Australia	8.5	8.7	8.7	9.0	8.8	9.0	8.7	9.1	8.7	9.0	+ 5.9
New Zealand	9.0	8.9	8.8	8.8	8.7	8.9	8.4	8.9	8.7	8.8*	- 2.2
Israel	5.8	6.0	6.1	6.3	6.3	6.3	6.6	6.8	7.0	7.0	+20.7
Japan	7.4	7.5	7.0	6.9	7.1	6.8	6.8	6.8	6.7*	6.9*	- 6.8
France	10.8	11.5	11.7	10.7	11.2	10.8	11.0	11.1	11.3*	10.6*	- 1.9
Germany (West)	11.0	11.1	11.4	10.8	11.2	11.3	11.2	11.9	12.0*	11.6*	+ 5.5
Italy	9.4	10.1	10.2	9.6	10.0	9.6	9.7	10.1	10.1	9.7*	+ 3.2
Poland	7.6	7.9	7.5	7.6	7.4	7.3	7.8	7.6	8.1	8.1*	+ 6.6
Spain	8.6	9.0	9.1	8.7	8.7	8.6	8.7	8.7	9.2*	8.6*	0.0
Sweden	9.8	10.2	10.1	10.0	10.1	10.0	10.1	10.4	10.5*	9.9*	+ 1.0
United Kingdom	12.0	11.9	12.2	11.3	11.5	11.8	11.3	11.8	11.9*	11.8*	- 1.7

\*Provisional

Source: United Nations Demographic Yearbook, 1970

<sup>1</sup>See Appendix



## Expectancy

Mortality patterns become more visible when life expectancy is considered. Table C<sup>1</sup> details life expectancy at each age for males and females during the period 1931 to 1966. In 1931, for example, a newborn male could expect to live 61.3 years. If born in 1966 however, the same male could expect to live 68.7 years — about 7 years longer. A man entering the labour force at age 18 could, in 1931, expect to live another 48.8 years. In 1966 his life expectancy at that age would be 51.1 years, or about 2 years longer. In retiring at age 65, a man in 1931 could expect to live another 12.7 years, or about age 78. In 1966, at retirement, the same man could expect to live 13.1 more years, or also to the approximate age of 78. In fact, in the 35 years between 1931 and 1966, life expectancy at age 65 had increased by only 4 months.

A female born in 1931 could expect to live 63.9 years (compared with 61.3 for males). A newborn in 1966 however, could expect to live to 75.5 (opposed to 68.7 for males). In 1931 life expectancy for females at age 18 was 51.9 years (50.5 for males), whereas by 1966 this had increased to 59.4 years (57.9 for males). At age 65 a female could expect to live another 13.5 years (12.8 for males). By 1966 however, she could expect to live another 16.7 years (opposed to 13.1 for males). At retirement, therefore, a female can be expected to outlive a male by about 4 years. In 1931, however, she could expect to outlive him by about 10 years only.

Thus, not only do females tend to live longer than males but the gap is widening. Sociologists believe that this discrepancy in life expectancy will eventually cause females to begin marrying younger men in order to decrease the prospect of being widowed.

## Seasonality

An examination of monthly data indicates that mortality seems to follow a seasonal pattern within the year. Table II compares the actual number of deaths recorded, by month, in 1965, with the number of deaths expected, should no seasonality exist. It can be seen from the table that deaths tended to be higher than expected during the winter months and lower than expected during the summer months. October, November, December, January, February, March

and April averaged almost 4 per cent more deaths than would normally have been expected, while May, June, July, August and September averaged over 5 per cent fewer than expected. This pattern is repeated from year to year with only minor variations. The exact causes of these fluctuations have been a puzzle to demographers for many years.

## County Mortality

Mortality patterns for most counties, districts and regions of Ontario, follow very closely the provincial trend. Over the last two decades, all but 7 counties experienced declines in crude death rates. Generally, rates were higher than average in the northern areas, while southern and central areas experienced lower rates. The largest decline occurred in Peel County where the crude rate dropped from 8.0 per 1,000 in 1951 to 4.2 in 1970. The male rate declined from 8.7 to 4.7 per 1,000, while the female rate fell to 3.7 from 7.4 during the same period.

## County Geometric Means

A more precise indication of county mortality trends can be found by examining the geometric means of the age specific rates. Kenora had the highest levels of mortality during this period with the geometric mean averaging 6.82. Sex specifically, Kenora ranked highest in female mortality (5.24) and second highest in male mortality (8.79). Cochrane had the highest male mortality level (8.86), while ranking second in female (4.96) and second overall (6.74).

Haliburton had the lowest overall rates, averaging a geometric mean of 4.76, and ranked second lowest for females with 3.59, while males finished in the lower half of the table with an average of 7.17. Peel County had the lowest male rates with the means averaging a surprising 3.54 over the nine-year period. Of the 53 counties and districts studied, 23 had levels above the provincial average and 30 were below.

## II — INFANT MORTALITY

### International Scene

An infant death is one that occurs before the child reaches one year of age. Infant mortality rates for selected countries are shown in Table III. During the period 1961 to 1969, all countries experienced decreasing rates. Poland had the highest rates, while Sweden enjoyed the lowest. The greatest change in rates was Japan where a level of 28.6 deaths per 1,000 live births in 1961 fell to a level of 15.3 in 1968 — a drop of 46.5 per cent in 8 years.

Rates in Australia do not seem to have undergone the dramatic changes evident in most other countries. Provisional data shows a decline of only 5.2 per cent during a 9 year period. Ontario rates are consistently lower than those for Canada and occupy sixth place in the international table. If the infant mortality rate in Sweden is to be taken as a standard, it is evident that the other countries have considerable room for improvement.

Table II—Deaths by Month, Ontario, 1965

	Number of Actual Deaths	Expected Deaths	Difference	%
January	4,880	4,615.69	264.31	5.73
February	4,347	4,169.01	177.99	4.27
March	4,917	4,615.69	301.31	6.53
April	4,480	4,466.79	13.21	0.30
May	4,466	4,615.69	—149.69	—3.24
June	4,384	4,466.79	—82.79	—1.85
July	4,287	4,615.69	—328.69	—7.12
August	4,228	4,615.69	—387.69	—8.40
September	4,227	4,466.79	—239.79	—5.37
October	4,625	4,615.69	9.31	0.20
November	4,615	4,466.79	148.21	3.32
December	4,890	4,615.69	274.31	5.94
Total	54,346	54,346.00	0.0	

Table III—Infant Mortality per 1,000 Live Births, Selected Countries, 1961-1970

Country	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Percent Change 1961-1970
Canada	27.2	27.6	26.3	24.7	23.6	23.1	22.0	20.8	19.3	18.8	-30.9
Ontario	23.0	23.2	22.8	21.3	20.5	20.2	19.7	19.0	17.6	16.8	-27.0
U.S.A.	25.3	25.3	25.2	24.8	24.7	23.7	22.4	21.8	20.7*	19.8*	-21.7
U.S.S.R.	32.0	32.0	30.9	29.0	27.0	26.1	26.3	26.4	25.8	24.4*	-23.8
Australia	19.5	20.4	19.5	19.1	18.5	18.2	18.3	17.8*	17.9*	17.9*	-8.2
New Zealand	22.8	20.4	19.6	19.1	19.5	17.7	18.0	18.7	16.9	16.7	-26.8
Israel	29.1	32.3	27.5	28.2	27.4	25.3	25.9	24.8	23.5	23.6	-18.9
Japan	28.6	26.4	23.2	20.4	18.5	19.3	14.9	15.3	15.3*	n/a	-46.5
France	25.6	25.7	25.4	23.3	22.0	21.7	20.7	20.4	16.4*	15.1	-41.0
Germany (West)	31.7	29.2	26.9	25.2	23.8	23.5	22.8	22.8	23.3	23.5*	-25.9
Italy	40.7	41.8	40.1	36.1	35.6	34.7	33.2	32.7	30.3	29.2	-28.3
Poland	54.1	54.8	48.7	47.7	41.8	38.9	38.1	33.4	34.3	33.1*	-38.8
Spain	46.2	41.6	40.5	37.9	37.3	36.0	34.0	32.0*	29.8*	27.8*	-39.8
Sweden	15.8	15.4	15.4	14.2	13.3	12.6	12.9	13.1	n/a	n/a	-17.1
United Kingdom	22.1	22.4	21.8	20.6	19.6	19.6	18.9	18.6	18.6	n/a	-15.8

\*Provisional

Source: United Nations Demographic Yearbook, 1970

**Ontario**

From Table IV it can be seen that infant mortality in Ontario has been steadily declining over the past 50 years. From a level of 91 infant deaths per 1,000 live births in 1921, the rate reached a low of 18 per 1,000 in 1969 — a drop of over 80 per cent. During the period 1960 - 1969, there was a decline of 25 per cent, as the rate fell from 24 deaths per 1,000 to 18.

More detailed data on infant mortality reveal that male rates fell from 25.87 in 1961 to 19.82 in 1969 — a decline of 23.4 per cent, while female infant mortality dropped 23.3 per cent from 19.98 to 15.33.

An examination of monthly data indicates that the vast majority of deaths occur during the first month. For both males and females, over 70 per cent of infant deaths occur within the first month of life. In addition, approximately 6 per cent of deaths occur during the second month and just over 5 per cent during the third. The percentage of deaths during the remaining 9 months gradually tapers off until only about one half of one per cent occur during the final month. There can be no question that the first month of life is by far the most critical in a child's existence. Furthermore, the female rate is about 23 per cent lower than that for males.

**County Infant Mortality**

Infant mortality patterns for the counties and districts of Ontario from 1921 to 1969 are presented in Table D<sup>1</sup>. All areas showed a pattern of declining infant mortality during the period. In 1921 Haliburton showed the highest rate at 158.8 deaths per 1,000 live births. By 1969, however, Haliburton's rate had fallen into line with the other areas and was actually lower than the provincial average.

The lowest rate in 1921 was in Lennox and Addington (46.2). The relatively small population of this county, resulting in very few births and infant deaths, caused rates to fluctuate greatly. In 1926, for example, the rate was 92.5, almost double that in 1921. In 1969 Russell had the highest level of infant mortality (43.2 per 1,000 live births) with Lennox and Addington again having the lowest (6.4).

In York County, the rates underwent almost continuous decline, from a level of 89.5 in 1921 to 14.6 in 1969 — a decrease of 83.7 per cent. By 1969 the level for York had almost reached the latest recorded level for Sweden (13.1), long considered the standard for which to strive.

One of the most dramatic declines in infant mortality occurred in Thunder Bay.

From a level of 111.9 in 1921, the rate fallen to 15.2 by 1969 — a drop of over 85 per cent. Similarly, in Carleton County rate fell by 85.5 per cent from 125.5 in 1921 to 18.2 in 1969. Great improvements in infant mortality have occurred throughout the province, making it one of the leaders in the fight against infant death.

**III — MATERNAL MORTALITY**

The decline in maternal mortality has been as dramatic as that in infant mortality. Table V shows maternal mortality rates for Ontario for the period 1938 - 1969. Since 1938 when reliable data first became available, the number of maternal deaths in Ontario

Table IV—Infant Mortality per 1,000 Live Births, Ontario, 1921-1969

Year	Infant Mortality	Year	Infant Mortality
1921	91	1946	37
1922	83	1947	36
1923	85	1948	35
1924	76	1949	37
1925	79		
1926	78	1950	35
1927	71	1951	31
1928	71	1952	31
1929	76	1953	28
		1954	26
1930	74	1955	26
1931	70	1956	25
1932	62	1957	25
1933	60	1958	25
1934	57	1959	24
1935	56		
1936	55	1960	24
1937	55	1961	23
1938	49	1962	23
1939	46	1963	23
		1964	21
1940	43	1965	21
1941	46	1966	20
1942	40	1967	20
1943	42	1968	19
1944	43	1969	18
1945	41		

Figures rounded to nearest whole number to be consistent with earlier data.

<sup>1</sup>See Appendix



lined from 251 to 20 in 1969 — a drop of 92 per cent.

Maternal mortality per 10,000 live births has fallen dramatically from 38.28 in 1938 to 1.53 in 1969 — a decline of 96 per cent. The *general maternal mortality rate* (deaths per 10,000 females aged 15-44) fell from 2.96 to .13 during this period — a drop of 96 per cent.

Table VI illustrates age specific maternal mortality rates for Ontario from 1961 to 1969. It demonstrates that the older the mother, the more likely she is to die during childbirth. Women aged 15 to 19, for example, averaged only 1.92 deaths for every 1,000 live births. For age group 40-44, however, the rate was more than five times as high. While maternal mortality for women aged 15-34 decreased between 1961 and 1969, there was no significant decline for women of age 34 and over. Thus the difference in the maternal mortality rate between younger and older women continues to increase.

#### CAUSES OF DEATH

The major causes account for about 85 per cent of all deaths in Ontario. Table E<sup>1</sup> outlines these causes, and presents rates specific to six selected age groups for the years 1961-1969. It is important to note that age group 0 is not considered in this table, and is dealt with separately.

#### Male Deaths

As can be seen in the table, male rates for accidental and violent deaths have remained relatively steady throughout the period. Age group 1-4 ranged from a high of .47 deaths per 1,000 population in 1962 to a low of .14 in 1969. For age group 5-14, 1963 and 1964 showed the highest rates at .34 deaths per 1,000. Age group 65+ had the highest rates of any remaining group, at about 2 deaths per 1,000 over the period.

The proportion of deaths from congenital malformations is relatively small for all age groups as this usually affects the newborn. Rates are highest for age group 1-4 and have tended to decline over the period. Rates for other age groups have remained at consistently low levels.

Death rates for neoplasms (cancer) remained at low levels for ages 1-34 throughout 1961-1969. For age group 35-64, rates increased slightly from 1.71 per 1,000 in 1961 to 1.85 in 1969. For males over 65,

**Table V—Maternal Mortality Rates per 10,000 Live Births, General Maternal Mortality Rates (per 10,000 females aged 15-44), Ontario, 1938-1969**

Year	Number of Maternal Deaths	Deaths per 10,000 live births	Deaths per 10,000 females aged 15-44
1938	251	38.28	2.96
1939	276	43.04	3.22
1940	254	37.21	2.94
1941	219	30.31	2.50
1942	206	26.35	2.28
1943	189	23.28	2.09
1944	198	25.36	2.17
1945	171	21.65	1.85
% change 1938-1945		-31.9%	-43.4%
1946	160	16.42	1.70
1947	129	11.85	1.35
1948	125	12.00	1.30
1949	134	12.57	1.37
1950	97	8.92	.97
% change 1946-1950		-39.4%	-45.7%
1951	97	8.45	.95
1952	100	8.07	.95
1953	69	5.32	.64
1954	69	5.06	.62
1955	81	5.80	.63
% change 1951-1955		-16.5%	-31.4%
1956	70	4.88	.61
1957	55	3.64	.46
1958	70	4.59	.57
1959	73	4.65	.59
1960	55	3.45	.44
% change 1956-1960		-21.4%	-29.3%
1961	67	4.25	.52
1962	54	3.46	.42
1963	46	2.97	.35
1964	43	2.82	.32
1965	44	3.11	.32
% change 1961-1965		-34.3%	-26.8%
1966	36	2.73	.25
1967	29	2.27	.23
1968	22	1.74	.17
1969	20	1.53	.13
% change 1966-1969		-44.4%	-44.0%
Total % change 1938-1969		-92.0%	-96.0%
			-95.6%

Table VI—Age Specific Maternal Mortality Rates per 10,000 Live Births, Ontario, 1961-1969

Years	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1961	4.06	1.91	3.16	6.92	6.67	11.59	38.02
1962	2.73	1.46	3.46	3.36	4.49	17.97	124.48
1963	.67	1.66	3.05	2.40	8.33	8.94	—*
1964	.65	1.69	2.15	5.34	4.63	6.65	—
1965	4.29	.91	1.58	4.39	7.97	9.74	36.50
1966	1.19	.48	2.29	4.13	8.13	13.07	—
1967	2.45	.70	1.16	6.04	4.67	3.10	—
1968	1.26	.69	1.70	2.12	4.17	10.73	—
1969	—*	.44	.53	2.63	7.84	15.49	—
Avg.	1.92	1.10	2.12	4.15	6.32	10.83	22.11

\*No deaths reported.

the rates were fairly high and tended to increase over the period, rising from 11.68 in 1961 to 13.35 in 1969.

Deaths resulting from nervous system disease tended to be high only in the 65+ age group. The rate declined from 10.28 in 1961 to 8.89 in 1968. This category was redefined in 1969, thereby making rates for that year not directly comparable with earlier years.

Death rates due to circulatory disease (mainly heart disease) were highest of all for age groups 35 and over. In age group 35 - 39, rates remained constant at just over 4 deaths per 1,000 males. However, for males aged 65 and over, rates rose from a level of 36.45 deaths per 1,000 in 1961 to a level of 42.61 in 1969. Deaths arising from respiratory diseases tended to be low in comparison with those from circulatory diseases, although the rate did increase from 4.33 to 6.14 for persons over 65 years.

Data showing the percentage distribution for the cause of death for each age group, indicate that in 1961, 4.77 per cent of accidental and violent deaths occurred in age group 1 - 4, while 38.19 per cent occurred in age group 35 - 64. The distribution of accidental and violent deaths over the different age groups tended to remain relatively stable over the period 1961 - 1969, except for age groups 1 - 4 and 15 - 24. Age group 1 - 4 accounted for 4.77 per cent of those deaths in 1961 but only 2.54 per cent in 1969. For ages 15 - 24, however, their percentage of accidental and violent deaths increased from 14.45 to 20.92.

Deaths due to neoplasms tended to concentrate in the middle- and old-age groups,

with about 37 per cent of deaths occurring in the 35 - 64 age bracket and 58 per cent in the 65+ group.

Similarly, deaths due to nervous system, circulatory and respiratory diseases, tended to affect only older males. Almost 80 per cent of deaths due to nervous system disease occurred in the 65+ age group with the remainder occurring in age group 35 - 64. In the case of circulatory disease, the 65+ group accounted for almost 70 per cent of deaths and the 35 - 64 group nearly 30 per cent, while for respiratory disease, it was 70 and 20 per cent respectively, with the other age groups accounting for the rest.

Data illustrating the percentage of deaths in each age group attributable to a particular cause, show that in 1961, 40.43 per cent of male deaths in age group 1 - 4 resulted from accidental or violent causes, 15.74 per cent from congenital malformations and 10.8 per cent from neoplasms. Similarly, in 1962, 43.81 per cent of male deaths in age group 1 - 4 were accidental or violent and in 1969 the percentage was 38.39.

During 1961 - 1969, the percentage of male deaths due to accidental and violent causes remained consistently high for males aged 34 and under. For the 15 - 24 age group, accidental and violent means accounted for 73 per cent of deaths in 1961 and over 89 per cent in 1968 and 1969.

For males aged 1 - 4, there was a decline in deaths due to congenital malformations, but the percentage of deaths due to neoplasms in 1969 was nearly double the 1961 figure. In addition, there was a slight decrease in the percentage of deaths due to both nervous and respiratory system diseases

in this age group. For males aged 35 and over, the number one cause of death is circulatory system disease and this continues to claim an ever increasing number of lives.

Deaths due to neoplasms are highest in the 34 - 64 male age group and lowest in the 15 - 24 group. During 1961 - 1969, the percentage of deaths due to neoplasms tended to increase. Deaths caused by circulatory system disease are highest in the 65+ age group, but the percentage is gradually falling. Respiratory diseases cause more deaths in the 1 - 4 age group than in other age groups.

### Female Deaths

Female rates, as can be observed in Table E<sup>1</sup>, follow male patterns fairly closely, except that rates tend to be 25 to 50 per cent lower. The exception, however, is deaths due to nervous system disease, where female rates are about equal to, if not greater than, male rates. It seems that while female resistance to disease is greater for most illnesses, female experiences patterns of nervous system disease similar to males. The reasons for this are difficult to trace, since the data available (Ontario Vital Statistics), although divided into eight categories, list two-thirds of deaths as 'other'.

The percentage distribution of female deaths basically follows the same pattern as the male distribution although deaths appear to concentrate even more in the 65+ age group. The only exception to this is the case of neoplasms where the proportion of deaths in the 34 - 65 age group is higher for females than for males. Thus, while neoplasms tend to strike females at an earlier age than most other diseases seem to strike them in life.

Data showing the percentage of deaths in each age group attributable to a particular cause indicate that, for females as well as males, accidental and violent causes result in a high percentage of deaths for age groups 1 - 34. In age group 15 - 24, 45 per cent of female deaths resulted from these causes in 1961, but by 1969 this figure had significantly increased to 64 per cent. For females aged 1 - 4, the percentage of deaths attributed to accidental and violent causes varied from 31 per cent to 52 per cent of all female deaths between 1961 and 1969.

Deaths due to congenital malformations varied from a low of 11 per cent in 19

<sup>1</sup>See Appendix



high of 23 per cent in 1969. The percentage of female deaths as a result of neoplasms increased during the period, while nervous system disorders decreased and respiratory disease remained about the same. For females aged 35 - 64, the number one cause of death was neoplasms, closely followed by heart disease. For the age group 65+ heart disease was the biggest killer with 41 per cent in 1961 and 60 per cent in 1969. Deaths resulting from neoplasms were high for the 35-64 age group and seem to be increasing throughout each group. Nervous system disease, which affects the 65+ age group the most, declined over the period. Respiratory system disease is most common in the 1 - 4 group, causing between 15 and 20 per cent of female deaths in this group.

#### Summary

The percentage of deaths for both males and females, due to accidental and violent causes, is increasing for persons aged 1 - 34, but the most dramatic increase has been in the 35 - 64 age group. In 1969, neoplasms and heart disease accounted for almost 72 per cent of total deaths in the 35 - 64 age group, while accounting for about 80 per cent in the 65+ age group. Improvement in the treatment of neoplasms and heart disease thus offers the best approach to reducing deaths for the middle-aged and elderly.

#### Regional Deaths

Table F<sup>1</sup> outlines 24 causes of death for the five economic regions of Ontario in 1966. Tuberculosis comes to the fore as one of the more preventable diseases. Ontario Vital Statistics reveal that in 1928 it caused 1,832 deaths, producing a death rate of 55.9 per 100,000 population. By 1966, however, the number of deaths had fallen to 132 — a rate of 1.9 per 100,000 population. This represents a remarkable decrease of almost 97 per cent in the death rate for tuberculosis. In 1966, Midwestern Ontario had the lowest rate (1.7) with the Northeastern region meaning 3.68 and the Northwestern region following 3.58 — more than triple the Midwestern region rate.

A surprising statistic shown in the table is the rate of death from circulatory disorders in the Georgian Bay region. This region witnessed a rate of 466 deaths per 100,000 persons from heart disease<sup>2</sup> in 1966. This is almost 41 per cent higher than the pro-

vincial figure. It is significant that the death rate for all causes for the Georgian Bay region was 29 per cent higher than the provincial figure in 1966.

The lowest level of heart disease was found in the Northeastern region, and was almost 19 per cent below the provincial average. This region also had the lowest overall death rate, averaging about 14 per cent below the provincial average.

The Central region, comprising Halton, Peel, York and Ontario counties and including the highly industrialized cities of Oshawa and Toronto had the second lowest mortality level. Furthermore, this region also ranked second lowest in the death rate from heart disease — almost 10 per cent below the provincial figure. It appears, at least for the year 1966, that theories stating that an urban-industrial environment is a cause of heart disease may be incorrect.

Motor vehicle accidents killed 1,636 persons in 1966 and were responsible for about 3 per cent of deaths. The highest rate of motor vehicle deaths was in the Northwestern region, while Central Ontario experienced the lowest rate — 33 per cent below the provincial average.

In 1966 there were 661 suicides in Ontario, accounting for about 1 per cent of all deaths. Although this is a substantial number, it is felt by many demographers that deaths by suicide are greatly under-reported, either consciously by physicians saving the surviving family the stigma of a suicidal death, or unconsciously because there is insufficient evidence to justify classifying the death as suicide. In countries where strict enforcement of suicide reporting is mandatory, rates tend to be much higher than in countries where reporting is usually left to doctors.

There were 66 homicides in the province in 1966, spread fairly evenly across the regions, with one significant exception. The lowest homicide rate was in the Midwestern region. However, the rate in Northwestern Ontario was twice as high as any other region and more than three times as high as the provincial average.

The Central region fared much better in terms of mortality than was generally thought, being lower than the provincial average in almost all categories. The Georgian Bay region was higher than average in many instances. Similarly, the Northwestern region

was considerably higher than the provincial figure for most causes of death.

#### V — CAUSES OF INFANT MORTALITY

Total male infant deaths (per 1,000 live births) declined from 25.87 in 1961 to 19.82 in 1969, while female rates dropped from 19.98 to 15.33 during the same period and were consistently lower than males.

Congenital malformations and immaturity are the main causes of death for both male and female infants. Together they accounted for 37 per cent of male deaths in 1961 and 36 per cent in 1969, corresponding figures for female deaths being 44 per cent in 1961 and 39 per cent in 1969. Infant deaths due to birth injuries and accidents remained relatively constant over the period and did not decrease in their proportion to the total number of infant deaths. In general, rates for both sexes are on the decline and improvement has been seen for most causes of infant mortality.

#### VI — CONCLUSION

Mortality rates have continued to decline over the last fifty years with the exception of the depression years and early war years. During the depression, low income levels caused people to defer hospital and doctor care much longer than usual. In addition, money was often not available to sustain the balanced diet necessary for good health. Since then, however, economic prosperity coupled with improved health care as well as significant advances in medical treatment have combined to lower provincial mortality levels.

Heart disease remains the biggest killer and, as yet, very little improvement has been made in the prevention and cure of this disease. Death rates from heart disease for both males and females have, in fact, increased over the last 10 years. Similarly, neoplasms have remained significantly high with rates failing to improve over the decade. These two areas remain of critical concern in the struggle against disease. Another area that could be improved is infant mortality. It is hoped that the present rate of 18 deaths per 1,000 live births will be reduced. In general, however, mortality has been steadily declining and will, in all probability continue to do so for some time to come.

Table A—Crude Death Rates, by Sex, Ontario, 1921-1970

	Male			Female			Total	
	Population	Deaths	Rate	Population	Deaths	Rate	Population	Deaths
1921	1,481.9	18,062	12.2	1,451.8	16,489	11.4	2,933.7	34,551
1922	1,501.3	17,726	11.8	1,478.7	16,308	11.0	2,980.0	34,034
1923	1,512.6	18,452	12.2	1,500.4	17,184	11.5	3,013.0	35,636
1924	1,531.9	17,153	11.2	1,527.1	15,925	10.4	3,059.0	33,078
1925	1,553.0	17,583	11.3	1,558.0	16,377	10.5	3,111.0	33,960
1926	1,576.1	18,721	11.9	1,588.2	17,188	10.8	3,164.3	35,909
1927	1,611.9	18,305	11.4	1,607.1	16,470	10.2	3,219.0	34,775
1928	1,651.5	19,457	11.8	1,626.5	17,671	10.9	3,278.0	37,128
1929	1,685.5	20,281	12.0	1,648.5	17,842	10.8	3,334.0	38,123
1930	1,718.7	19,827	11.5	1,667.3	17,486	10.5	3,386.0	37,313
1931	1,748.9	19,137	10.9	1,682.8	16,568	9.8	3,431.7	35,705
1932	1,768.3	19,196	10.9	1,704.7	17,273	10.1	3,473.0	36,469
1933	1,788.3	18,489	10.3	1,723.7	16,812	9.8	3,512.0	35,301
1934	1,804.4	18,731	10.4	1,739.6	16,388	9.4	3,544.0	35,119
1935	1,820.5	19,281	10.6	1,754.5	17,036	9.7	3,575.0	36,317
1936	1,840.0	19,916	10.8	1,765.5	17,655	10.0	3,605.5	37,571
1937	1,851.2	20,690	11.2	1,785.8	17,785	10.0	3,637.0	38,475
1938	1,867.9	19,814	10.6	1,804.1	17,076	9.5	3,672.0	36,890
1939	1,884.5	20,310	10.8	1,823.5	17,220	9.4	3,708.0	37,530
1940	1,902.7	20,923	11.0	1,844.3	17,580	9.5	3,747.0	38,503
1941	1,921.2	21,549	11.2	1,866.5	17,677	9.5	3,787.7	39,226
1942	1,966.4	21,349	10.9	1,917.6	17,770	9.3	3,884.0	39,149
1943	1,981.6	22,159	11.2	1,933.4	18,904	9.8	3,915.0	41,063
1944	2,004.6	21,629	10.8	1,958.4	18,152	9.3	3,963.0	39,781
1945	2,014.6	21,563	10.7	1,985.4	17,936	9.0	4,000.0	39,499
1946	2,064.3	21,849	10.6	2,028.7	17,909	8.8	4,093.0	39,758
1947	2,106.4	22,891	10.9	2,069.6	18,728	9.0	4,176.0	41,619
1948	2,158.9	23,394	10.8	2,116.1	18,970	9.0	4,275.0	42,364
1949	2,210.5	24,123	10.9	2,167.5	19,256	8.9	4,378.0	43,379
1950	2,249.7	24,502	10.9	2,221.3	19,446	8.8	4,471.0	43,948
1951	2,314.2	24,483	10.6	2,283.4	19,498	8.5	4,597.6	43,981
1952	2,412.5	25,072	10.4	2,375.5	19,330	8.1	4,788.0	44,402
1953	2,491.9	25,347	10.2	2,449.1	19,895	8.1	4,941.0	45,242
1954	2,580.0	25,050	9.7	2,535.0	19,465	7.7	5,115.0	44,515
1955	2,653.8	25,890	9.8	2,612.2	19,544	7.5	5,266.0	45,434
1956	2,721.5	26,868	9.9	2,683.4	20,363	7.6	5,404.9	47,231
1957	2,840.0	28,059	9.9	2,796.0	21,105	7.5	5,636.0	49,164
1958	2,930.9	27,869	9.5	2,890.1	20,808	7.2	5,821.0	48,677
1959	3,005.8	28,695	9.5	2,963.2	21,905	7.4	5,969.0	50,600
1960	3,074.7	29,408	9.6	3,036.3	22,076	7.3	6,111.0	51,484
1961	3,134.5	29,248	9.3	3,101.6	21,749	7.0	6,236.1	50,997
1962	3,187.5	29,708	9.3	3,163.5	22,448	7.1	6,351.0	52,156
1963	3,247.8	30,762	9.5	3,233.2	22,855	7.1	6,481.0	53,617
1964	3,318.0	30,029	9.1	3,313.0	22,175	6.7	6,631.0	52,204
1965	3,394.8	31,275	9.2	3,393.2	23,071	6.8	6,788.0	54,346
1966	3,479.2	31,142	9.0	3,481.7	23,029	6.6	6,960.9	54,171
1967	3,573.2	31,694	8.9	3,575.8	23,184	6.5	7,149.0	54,878
1968	3,649.8	31,795	8.7	3,656.2	23,757	6.5	7,306.0	55,552
1969	3,721.8	31,799	8.5	3,730.2	23,922	6.4	7,452.0	55,721
1970	3,812.0	32,470	8.5	3,825.0	24,225	6.3	7,637.0	56,695



Table B—Death Rates, by Age and Sex, Ontario, 1921-1970

Age Group	Male																	
	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
4	31.8	24.7	21.2	16.1	14.8	12.9	8.9	7.5	6.4	6.2	6.2	5.6	5.0	4.8	4.7	4.4	4.4	4.5
9	3.3	2.1	1.8	1.6	1.3	1.1	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
14	1.9	1.9	1.4	1.2	1.2	0.9	0.8	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.4	0.4
19	3.1	2.6	2.2	1.6	1.7	1.2	1.3	1.4	1.1	1.0	1.1	1.0	1.1	1.1	1.3	1.1	1.1	1.2
24	3.7	2.9	2.9	2.1	2.3	1.7	1.6	1.5	1.5	1.6	1.6	1.6	1.7	1.5	1.6	1.6	1.5	1.4
29	4.3	3.1	3.6	2.4	2.2	1.6	1.5	1.5	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.2
34	4.1	3.2	3.7	3.0	2.4	1.9	1.8	1.8	1.4	1.4	1.6	1.5	1.3	1.5	1.3	1.3	1.4	1.3
39	4.9	4.9	3.9	3.8	3.5	2.7	2.3	2.2	2.2	2.2	2.3	2.0	2.1	2.0	2.1	2.0	2.0	2.0
44	6.0	6.0	5.4	5.0	4.8	4.2	4.0	3.2	3.3	3.4	3.5	3.5	3.4	3.2	3.6	3.3	3.1	3.3
49	7.0	7.6	7.8	7.3	7.1	6.5	6.5	5.9	6.1	5.6	5.8	5.7	5.5	5.9	5.8	5.8	5.6	5.5
54	10.5	10.1	11.2	11.0	11.6	10.4	10.6	10.3	10.1	10.2	10.0	9.9	10.4	9.9	9.9	9.3	9.2	9.4
59	16.0	15.1	16.8	15.6	16.6	15.8	17.6	16.4	16.2	16.2	16.1	16.3	15.9	16.0	16.3	15.8	15.5	15.2
64	23.3	25.5	23.7	25.4	26.1	24.1	26.1	25.6	25.6	26.0	26.1	26.3	26.5	24.8	25.4	24.9	24.3	24.9
69	34.4	40.8	38.1	38.7	38.4	38.1	37.0	39.5	37.7	38.0	39.1	37.0	38.5	38.6	39.1	39.4	39.3	38.8
74	61.2	66.6	56.2	63.0	59.6	54.9	55.6	57.0	59.0	57.8	58.8	56.6	57.7	56.6	55.8	56.1	55.3	59.4
79	93.9	108.2	93.0	96.4	97.9	87.2	91.9	88.3	86.3	86.7	90.0	83.9	87.8	85.7	85.8	83.7	78.6	79.3
84	138.2	164.4	142.9	159.0	147.6	132.8	136.3	135.7	129.2	129.2	129.9	124.4	135.6	132.2	128.1	130.9	128.5	130.9
+	239.5	268.1	246.1	255.6	253.4	233.6	240.2	226.6	215.8	217.9	224.5	206.3	224.7	224.7	215.5	219.0	219.9	213.0
ometric Mean	13.5	12.8	11.9	10.8	10.5	8.9	8.6	8.0	7.5	7.5	7.7	7.3	7.3	7.3	7.3	7.2	7.0	7.0

Age Group	Female																	
	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
4	24.7	19.8	17.0	13.3	11.3	10.0	7.2	6.0	4.9	4.9	4.7	4.2	3.9	3.7	3.6	3.6	3.5	3.4
9	2.7	1.9	1.2	1.3	0.9	0.8	0.6	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3
14	2.0	1.5	1.3	0.7	0.7	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.3
19	2.4	2.2	1.7	1.4	1.0	0.8	0.6	0.5	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.5
24	3.5	3.0	2.9	2.2	1.4	1.1	0.7	0.5	0.5	0.5	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.4
29	4.3	3.2	3.0	2.5	1.7	1.3	0.9	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.5	0.6	0.6	0.6
34	4.5	4.1	3.4	3.2	2.0	1.7	1.1	0.9	0.9	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.8	0.8
39	5.6	4.6	4.5	3.4	2.8	2.3	1.9	1.3	1.3	1.2	1.3	1.1	1.2	1.2	1.3	1.2	1.2	1.2
44	6.2	5.3	4.5	4.4	3.8	3.0	2.8	2.2	1.9	2.3	2.0	1.9	2.0	2.0	2.0	2.0	2.0	1.9
49	7.5	7.1	6.4	5.9	5.6	5.0	4.3	3.6	3.3	3.5	3.3	3.0	3.3	3.3	3.0	3.1	3.5	3.1
54	10.3	9.2	8.7	8.9	7.7	6.7	5.8	5.8	5.3	5.2	5.4	5.2	5.4	5.1	4.8	5.0	4.9	4.9
59	13.9	14.6	13.3	12.6	12.2	10.9	10.1	9.0	7.9	8.1	8.0	8.0	7.9	7.8	7.7	7.7	7.7	7.6
64	20.9	22.4	20.4	20.9	18.0	16.0	16.2	14.3	12.3	12.8	12.7	12.7	12.3	12.5	12.0	12.0	11.6	10.7
69	34.7	35.5	30.3	32.9	30.0	26.1	25.3	22.1	21.4	21.2	20.3	19.6	19.1	18.8	18.9	18.4	18.3	18.5
74	56.9	52.9	48.5	54.1	47.1	43.5	40.9	37.2	33.8	35.0	34.6	33.0	32.6	30.8	30.5	30.5	29.0	29.3
79	88.8	92.5	88.3	86.0	79.9	72.1	72.9	67.2	61.0	58.3	58.9	55.8	56.1	55.7	51.3	50.0	49.0	49.0
84	134.0	145.7	132.1	155.0	132.7	118.2	120.0	112.8	104.8	104.0	103.2	96.4	96.6	92.4	93.1	92.6	88.5	87.9
+	243.2	271.0	226.8	251.7	231.0	217.5	212.2	202.0	193.7	196.2	192.7	174.9	189.7	179.5	177.6	184.3	182.5	184.6
ometric Mean	12.9	11.7	10.3	9.5	7.8	6.7	5.7	4.7	4.3	4.2	4.3	4.0	4.1	4.1	4.0	3.9	3.9	3.9

Table C—Life Expectancy, by Age and Sex, Ontario, 1931-1966

Male Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52
0	61.30	64.55	66.87	67.80	68.32	68.71	40	31.56	31.54	32.00
1	65.05	66.74	68.34	68.76	69.14	69.29	41	30.71	30.66	31.10
2	64.60	66.11	67.51	67.89	68.24	68.38	42	29.87	29.79	30.20
3	63.87	65.18	66.62	66.97	67.31	67.44	43	29.03	28.93	29.30
4	63.06	64.31	65.71	66.04	66.38	66.50	44	28.20	28.07	28.40
5	62.20	63.42	64.78	65.10	65.42	65.54	45	27.37	27.22	27.60
6	61.33	62.52	63.83	64.15	64.45	64.57	46	26.55	26.37	26.70
7	60.46	61.60	62.88	63.20	63.49	63.61	47	25.73	25.53	25.90
8	59.57	60.68	61.94	62.24	62.52	62.64	48	24.92	24.70	25.00
9	58.68	59.74	60.98	61.27	61.55	61.66	49	24.11	23.88	24.20
10	57.78	58.81	60.03	60.31	60.58	60.69	50	23.32	23.08	23.40
11	56.86	57.87	59.07	59.34	59.60	59.71	51	22.53	22.30	22.60
12	55.95	56.92	58.11	58.37	58.63	58.73	52	21.76	21.52	21.80
13	55.03	55.98	57.15	57.40	57.66	57.76	53	20.99	20.77	21.10
14	54.11	55.04	56.20	56.44	56.70	56.79	54	20.24	20.02	20.30
15	53.20	54.11	55.25	55.48	55.74	55.83	55	19.49	19.29	19.60
16	52.31	53.19	54.31	54.54	54.78	54.88	56	18.76	18.56	18.80
17	51.42	52.27	53.37	53.60	53.84	53.94	57	18.04	17.85	18.10
18	50.54	51.37	52.44	52.66	52.89	53.00	58	17.33	17.15	17.40
19	49.66	50.47	51.51	51.73	51.96	52.07	59	16.63	16.46	16.80
20	48.79	49.57	50.58	50.81	51.03	51.14	60	15.94	15.79	16.10
21	47.93	48.67	49.66	49.89	50.10	50.21	61	15.26	15.13	15.50
22	47.07	47.78	48.74	48.96	49.17	49.29	62	14.59	14.48	14.80
23	46.21	46.88	47.82	48.04	48.25	48.37	63	13.94	13.85	14.20
24	45.35	45.99	46.89	47.12	47.32	47.44	64	13.30	13.23	13.60
25	44.50	45.09	45.97	46.19	46.39	46.51	65	12.67	12.63	13.00
26	43.64	44.18	45.04	45.27	45.46	45.58	66	12.06	12.04	12.40
27	42.78	43.27	44.10	44.33	44.52	44.64	67	11.47	11.46	11.80
28	41.92	42.36	43.17	43.40	43.58	43.70	68	10.89	10.90	11.20
29	41.05	41.44	42.23	42.47	42.64	42.76	69	10.33	10.35	10.70
30	40.19	40.52	41.29	41.53	41.69	41.81	70	9.79	9.82	10.20
31	39.32	39.61	40.36	40.60	40.75	40.86	71	9.25	9.30	9.70
32	38.45	38.69	39.42	39.66	39.80	39.91	72	8.74	8.79	9.10
33	37.58	37.78	38.49	38.73	38.86	38.97	73	8.24	8.30	8.60
34	36.71	36.88	37.56	37.79	37.92	38.02	74	7.77	7.83	8.10
35	35.85	35.97	36.63	36.86	36.98	37.08	75	7.32	7.39	7.70
36	34.98	35.07	35.70	35.93	36.04	36.14	76	6.90	6.97	7.20
37	34.12	34.18	34.77	35.00	35.11	35.21	77	6.50	6.57	6.80
38	33.27	33.49	33.85	34.08	34.19	34.28	78	6.12	6.20	6.50
39	32.41	32.41	32.94	33.16	33.27	33.36	79	5.76	5.84	6.10



5-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67
4	32.35	32.44	80	5.42	5.50	5.89	5.81	5.97	5.99
2	31.43	31.53	81	5.09	5.16	5.57	5.46	5.63	5.64
2	30.52	30.62	82	4.77	4.85	5.28	5.13	5.30	5.32
2	29.62	29.72	83	4.47	4.54	5.00	4.82	4.99	5.00
2	28.72	28.84	84	4.18	4.26	4.74	4.52	4.70	4.71
4	27.84	27.95	85	3.91	3.98	4.50	4.25	4.41	4.43
7	26.97	27.08	86	3.66	3.73	4.28	3.98	4.15	4.16
2	26.12	26.22	87	3.42	3.49	4.07	3.73	3.89	3.91
7	25.27	25.36	88	3.20	3.26	3.88	3.50	3.65	3.67
4	24.44	24.52	89	2.99	3.05	3.69	3.28	3.43	3.45
2	23.61	23.70	90	2.79	2.85	3.52	3.07	3.21	3.24
1	22.80	22.89	91	2.61	2.67	3.37	2.88	3.01	3.04
2	22.00	22.09	92	2.44	2.49	3.22	2.70	2.82	2.85
4	21.22	21.31	93	2.28	2.33	3.08	2.52	2.64	2.67
7	20.45	20.54	94	2.13	2.28	2.95	2.36	2.47	2.51
2	19.69	19.78	95	1.99	2.04	2.83	2.21	2.31	2.35
8	18.95	19.04	96	1.86	1.91	2.72	2.06	2.15	2.20
5	18.23	18.31	97	1.74	1.78	2.62	1.93	2.01	2.06
4	17.52	17.60	98	1.63	1.67	2.52	1.79	1.88	1.93
5	16.84	16.91	99	1.52	1.56	2.43	1.66	1.75	1.81
8	16.17	16.23	100	1.43	1.45	2.34	1.53	1.64	1.69
2	15.51	15.57	101	1.33	1.35	2.26	1.40	1.52	1.58
9	14.87	14.93	102	1.25	1.25	2.19	1.26	1.42	1.48
7	14.25	14.30	103	1.17	1.13	2.09	1.09	1.29	1.38
6	13.64	13.69	104	1.09	0.97	1.97	0.80	1.25	1.29
7	13.05	13.10	105		0.68	1.83	0.50	1.00	1.21
0	12.47	12.52	106			1.71		0.50	1.13
4	11.89	11.96	107			1.63			1.05
9	11.34	11.42	108			1.40			
5	10.80	10.88	109			1.00			
3	10.27	10.36	110			0.50			
2	9.77	9.86	111						
3	9.28	9.36							
4	8.81	8.88							
7	8.35	8.42							
1	7.92	7.97							
7	7.49	7.54							
5	7.09	7.13							
5	6.70	6.73							
7	6.33	6.35							

Table C—Life Expectancy, by Age and Sex, Ontario, 1931-1966—Continued

Female										
Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52
0	63.92	68.43	71.85	73.57	74.40	75.53	40	32.90	34.11	35.22
1	66.84	70.07	72.91	74.25	74.95	75.87	41	32.05	33.22	34.81
2	66.35	69.32	72.06	73.38	74.04	74.96	42	31.19	32.33	33.91
3	65.57	68.45	71.14	72.45	73.10	74.01	43	30.34	31.45	33.01
4	64.73	67.57	70.21	71.51	72.15	73.05	44	29.50	30.57	32.11
5	63.86	66.64	69.27	70.56	71.19	72.09	45	28.65	29.70	31.21
6	62.97	65.71	68.32	69.59	70.22	71.12	46	27.82	28.84	30.31
7	62.06	64.76	67.36	68.62	69.25	70.15	47	26.99	27.90	29.41
8	61.14	63.81	66.39	67.65	68.27	69.18	48	26.17	27.13	28.51
9	60.21	62.86	65.43	66.68	67.29	68.20	49	25.35	26.29	27.71
10	59.28	61.90	64.46	65.70	66.31	67.22	50	24.54	25.45	26.81
11	58.35	60.94	63.49	64.72	65.33	66.24	51	23.74	24.62	25.91
12	57.42	59.99	62.52	63.75	64.35	65.26	52	22.94	23.80	25.11
13	56.49	59.03	61.54	62.77	63.37	64.28	53	22.15	22.98	24.21
14	55.56	58.07	60.57	61.79	62.38	63.30	54	21.37	22.18	23.41
15	54.64	57.12	59.60	60.82	61.40	62.32	55	20.61	21.39	22.51
16	53.72	56.17	58.63	59.84	60.43	61.34	56	19.85	20.61	21.71
17	52.81	55.23	57.66	58.87	59.45	60.37	57	19.10	19.84	20.91
18	51.91	54.28	56.70	57.90	58.47	59.40	58	18.37	19.08	20.11
19	51.02	53.34	55.73	56.92	57.50	58.43	59	17.65	18.33	19.31
20	50.13	52.40	54.76	55.95	56.53	57.45	60	16.93	17.59	18.51
21	49.25	51.47	53.80	54.98	55.55	56.48	61	16.21	16.85	17.81
22	48.38	50.53	52.83	54.01	54.58	55.51	62	15.51	16.13	17.01
23	47.51	49.60	51.87	53.04	53.61	54.54	63	14.82	15.41	16.31
24	46.65	48.67	50.91	52.08	52.64	53.57	64	14.14	14.71	15.61
25	45.78	47.74	49.95	51.11	51.67	52.60	65	13.47	14.03	14.91
26	44.92	46.82	48.98	50.14	50.70	51.62	66	12.83	13.36	14.21
27	44.06	45.90	48.02	49.18	49.73	50.65	67	12.19	12.71	13.51
28	43.19	44.98	47.06	48.22	48.76	49.68	68	11.58	12.08	12.81
29	42.33	44.06	46.10	47.25	47.80	48.71	69	10.98	11.46	12.21
30	41.47	43.14	45.14	46.29	46.83	47.74	70	10.38	10.85	11.61
31	40.60	42.23	44.19	45.33	45.86	46.77	71	9.80	10.26	10.91
32	39.73	41.31	43.23	44.36	44.90	45.80	72	9.24	9.68	10.31
33	38.87	40.40	42.28	43.40	43.94	44.84	73	8.70	9.13	9.81
34	38.00	39.49	41.34	42.44	42.98	43.87	74	8.18	8.59	9.21
35	37.15	38.58	40.40	41.49	42.02	42.91	75	7.70	8.09	8.71
36	36.29	37.68	39.46	40.53	41.06	41.96	76	7.24	7.61	8.21
37	35.44	36.79	38.53	39.58	40.11	41.00	77	6.82	7.15	7.71
38	34.59	35.89	37.60	38.63	39.16	40.05	78	6.43	6.72	7.31
39	33.75	35.00	36.67	37.68	38.21	39.11	79	6.06	6.31	6.91



5-57	1960-62	1965-67	Age	1930-32	1940-42	1950-52	1955-57	1960-62	1965-67
74	37.27	38.17	80	5.70	5.92	6.40	6.75	6.75	7.27
81	36.33	37.23	81	5.37	5.54	6.01	6.35	6.31	6.81
88	35.40	36.29	82	5.05	5.19	5.64	5.97	5.89	6.37
95	34.47	35.36	83	4.75	4.85	5.29	5.62	5.49	5.96
04	33.55	34.44	84	4.46	4.53	4.97	5.29	5.12	5.57
13	32.64	33.52	85	4.18	4.24	4.66	4.98	4.77	5.20
22	31.73	32.61	86	3.91	3.97	4.37	4.68	4.45	4.85
33	30.83	31.70	87	3.65	3.72	4.10	4.41	4.14	4.52
44	29.93	30.80	88	3.41	3.48	3.85	4.15	3.85	4.21
55	29.04	29.91	89	3.17	3.26	3.61	3.91	3.58	3.92
67	28.16	29.02	90	2.95	3.04	3.39	3.69	3.32	3.65
80	27.29	28.14	91	2.73	2.83	3.18	3.48	3.09	3.40
94	26.42	27.27	92	2.53	2.63	2.98	3.28	2.87	3.16
08	25.56	26.41	93	2.34	2.43	2.79	3.09	2.66	2.94
23	24.70	25.55	94	2.16	2.25	2.62	2.92	2.47	2.73
40	23.86	24.70	95	1.99	2.07	2.46	2.75	2.29	2.54
57	23.01	23.86	96	1.83	1.90	2.31	2.60	2.12	2.36
75	22.18	23.03	97	1.68	1.74	2.16	2.45	1.97	2.19
94	21.36	22.20	98	1.54	1.58	2.03	2.32	1.82	2.03
04	20.54	21.39	99	1.41	1.44	1.90	2.19	1.68	1.88
35	19.74	20.59	100	1.29	1.30	1.78	2.06	1.55	1.74
57	18.95	19.79	101	1.17	1.17	1.66	1.95	1.43	1.62
80	18.16	19.01	102	1.07	1.05	1.55	1.83	1.30	1.50
94	17.39	18.24	103	0.97	0.94	1.41	1.70	1.18	1.38
30	16.64	17.47	104	0.87	0.83	1.26	1.57	1.00	1.28
56	15.90	16.72	105		0.72	1.09	1.44	0.83	1.18
84	15.17	15.98	106			0.80	1.28	0.50	1.09
04	14.46	15.25	107			0.50	1.11		1.01
45	13.77	14.53	108				1.00		0.93
78	13.09	13.82	109				0.50		
02	12.42	13.13	110						
48	11.76	12.46							
85	11.12	11.80							
25	10.50	11.15							
67	9.89	10.53							
02	9.31	9.93							
59	8.75	9.35							
09	8.21	8.80							
62	7.70	8.27							
17	7.21	7.76							

Table D—Infant Mortality Rates, by County, Ontario, 1921-1969

	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969
<b>EASTERN ONTARIO</b>																	
<b>A—Ottawa Valley:</b>																	
Carleton	125.5	115.4	95.2	83.5	53.0	45.4	27.6	30.3	25.0	23.1	25.3	24.2	25.8	22.7	19.3	20.4	18.7
Lanark	102.1	54.9	55.8	48.8	32.8	42.2	43.9	27.5	25.4	29.4	32.0	23.3	21.2	23.0	17.8	15.1	11.1
Prescott	103.5(1)	117.0	81.3	87.4	86.8	64.8	58.2	44.1	31.3	29.3	40.2	29.6	23.1	19.1	24.5	32.4	24.1
Renfrew	101.1	91.4	84.2	66.5	61.3	46.2	44.0	36.4	29.5	36.7	31.5	27.7	28.5	29.3	25.6	24.8	26.1
Russell	(1)	116.4	109.8	85.1	67.0	53.9	46.9	24.1	28.4	41.4	28.6	26.1	17.2	35.7	18.8	41.0	43.1
<b>B—Upper St. Lawrence:</b>																	
Dundas	(2)	74.2	61.8	44.8	65.6	51.5	23.1	40.8	37.1	34.9	35.2	18.7	32.6	36.4	29.8	22.4	12.1
Frontenac	99.0	94.0	73.1	66.2	54.7	38.5	43.0	32.6	26.1	26.2	21.9	23.7	30.4	26.3	24.0	20.5	20.1
Glengarry	(2)	67.8	108.6	39.6	82.7	35.3	66.0	29.8	37.9	35.8	21.5	20.6	19.8	41.5	16.8	24.5	28.1
Grenville	(3)	67.9	69.0	67.0	82.2	72.7	76.9	30.4	13.7	30.5	18.9	15.1	23.8	14.2	22.3	35.8	19.1
Leeds	96.4(3)	71.5	74.0	57.0	58.9	48.2	41.9	32.1	20.3	23.2	20.2	26.7	18.7	13.6	30.6	34.0	19.1
Stormont	91.8(2)	100.2	103.6	71.2	64.9	32.1	35.1	28.2	24.7	30.4	31.2	24.4	23.4	24.1	15.3	18.6	22.1
<b>LAKE ONTARIO</b>																	
Durham	(4)	35.6	57.7	39.7	39.6	32.3	30.7	31.2	25.5	23.8	16.7	16.4	19.8	18.7	24.4	31.4	18.1
Haliburton	158.8	76.0	41.4	83.8	72.0	24.0	28.7	22.3	34.3	13.2	6.2	17.5	37.4	49.5	11.2	34.5	16.1
Hastings	93.4	71.6	77.5	70.2	59.5	43.5	43.0	30.7	21.2	24.1	22.3	25.9	25.0	18.0	25.0	23.0	24.1
Lennox and Addington	46.2	92.5	77.2	78.4	89.6	60.6	35.5	24.0	15.7	19.2	21.3	20.1	20.4	10.9	6.8	26.6	6.1
Northumberland	88.3(4)	67.5	78.9	60.3	49.0	50.7	13.4	22.9	32.3	22.4	28.8	21.8	13.8	18.5	26.6	12.4	23.1
Peterborough	80.8	63.2	62.7	63.8	37.5	22.1	35.3	27.1	21.2	29.4	20.9	13.3	19.0	20.5	17.5	14.9	14.1
Prince Edward	87.1	56.5	50.2	43.5	67.4	56.2	29.5	25.7	19.5	27.7	11.5	31.1	25.2	15.6	31.1	24.5	13.1
Victoria	99.8	59.3	59.8	66.7	44.8	32.1	35.8	19.9	24.0	25.6	24.3	25.1	24.7	22.9	17.9	12.2	18.1
<b>CENTRAL ONTARIO</b>																	
Halton	89.1	82.0	40.8	47.3	36.6	42.8	23.2	15.6	17.9	21.6	20.7	22.5	16.9	14.7	22.7	16.5	16.1
Ontario	92.7	75.1	67.4	53.1	41.8	26.9	29.3	25.2	22.1	23.4	20.8	23.8	16.5	17.6	18.7	17.2	13.1
Peel	95.6	78.8	30.8	35.7	22.5	30.9	27.1	22.8	18.8	20.7	21.5	17.9	21.0	17.5	15.1	16.0	13.1
York	89.5	71.1	64.3	45.5	34.6	30.0	24.0	20.9	20.3	20.3	19.5	18.9	17.8	18.5	17.6	16.6	16.1
<b>NIAGARA</b>																	
<b>A—Burlington:</b>																	
Brant	61.9	67.9	60.2	51.6	49.6	47.7	25.9	23.5	21.1	19.7	19.8	22.8	16.2	19.5	20.9	19.5	23.1
Wentworth	90.1	68.1	61.2	41.6	34.6	30.7	31.0	22.2	17.8	20.9	16.9	18.8	18.8	16.8	16.4	16.6	13.1
<b>B—Niagara:</b>																	
Haldimand	48.2	58.5	62.7	22.6	39.5	30.0	29.0	24.4	18.9	29.6	15.5	18.0	8.8	15.0	29.1	16.3	13.1
Lincoln	87.2	66.3	43.0	59.2	34.7	43.0	22.1	22.6	16.1	19.8	19.6	17.0	19.2	20.8	17.8	24.0	13.1
Welland	99.2	73.7	66.4	42.7	44.7	34.1	27.3	23.5	20.4	27.6	24.4	20.5	19.4	19.2	17.4	15.7	13.1
<b>LAKE ERIE</b>																	
Elgin	78.1	67.5	66.4	53.1	45.8	36.5	20.7	16.0	20.0	22.0	22.6	25.5	25.5	10.4	17.3	14.7	14.1
Middlesex	87.0	64.0	54.7	52.6	34.1	35.4	24.7	24.4	24.6	23.2	28.6	21.0	18.5	23.4	16.5	18.3	13.1
Norfolk	95.7	50.8	74.1	38.4	50.3	41.9	34.2	11.4	28.2	28.6	23.4	25.6	20.2	29.4	25.7	9.6	28.1
Oxford	83.6	58.3	48.1	45.8	47.7	30.5	24.1	22.9	16.7	22.3	26.5	16.8	18.1	30.0	17.6	16.2	13.1

(1) Russell included with Prescott

(2) Dundas and Glengarry included with Stormont

(3) Grenville included with Leeds

(4) Durham included with Northumberland



Table D—Infant Mortality Rates, by County, Ontario, 1921-1969—Continued

	1921	1926	1931	1936	1941	1946	1951	1956	1961	1962	1963	1964	1965	1966	1967	1968	1969
<b>KE ST. CLAIR</b>																	
-Border:																	
Essex	83.4	91.6	64.1	43.8	31.7	38.1	32.6	25.7	23.9	20.5	21.7	24.2	22.1	21.4	22.4	23.0	25.6
Kent	85.3	73.8	74.8	43.6	45.2	36.9	26.0	25.1	22.6	22.8	22.7	24.4	25.3	22.0	17.2	24.2	23.0
-Lambton:																	
Lambton	89.2	64.1	59.9	51.3	40.4	36.6	29.9	18.7	23.9	19.2	19.6	23.6	19.1	24.2	23.9	18.5	19.2
<b>DWESTERN ONTARIO</b>																	
Huron	56.8	73.4	51.9	36.5	31.3	24.6	32.8	22.7	23.3	16.3	29.9	19.2	22.1	17.0	19.1	9.0	23.3
Perth	73.6	64.2	60.5	35.5	41.8	43.7	34.8	24.4	29.2	18.0	24.7	14.1	20.7	20.8	24.0	19.4	21.2
Waterloo	73.8	55.9	48.8	40.7	33.5	32.7	21.8	20.5	20.0	18.4	22.8	20.7	18.0	19.6	21.2	18.3	19.3
Wellington	84.9	76.9	63.4	46.9	54.1	30.7	35.5	23.7	31.1	17.2	20.0	19.3	17.6	25.9	23.6	20.6	15.0
<b>ORGIAN BAY</b>																	
-Blue Water:																	
Bruce	95.0	54.0	66.7	75.0	47.1	39.6	35.9	17.1	31.1	27.8	26.0	22.0	23.8	13.3	15.6	13.9	20.8
Dufferin	98.3	70.9	78.2	24.0	31.6	42.7	27.4	36.3	31.5	32.5	25.9	20.8	25.5	21.0	22.7	24.9	20.3
Grey	69.8	51.9	73.8	48.3	43.6	43.6	37.4	21.4	15.5	25.8	18.0	21.9	29.5	25.3	18.1	23.2	19.0
Simcoe	89.8	76.6	71.7	39.3	52.0	33.3	29.8	28.7	33.5	21.3	29.1	24.0	22.5	23.9	19.3	22.2	24.5
-Highlands:																	
Muskoka	59.3	56.6	58.2	68.8	74.0	46.2	35.4	19.7	28.1	24.2	14.8	16.3	6.9	16.6	14.5	13.6	9.0
Parry Sound	80.1	59.7	79.7	47.8	62.6	40.2	37.3	29.3	34.7	12.2	30.1	37.2	19.9	26.5	20.5	25.7	24.9
<b>ORTHEASTERN ONTARIO</b>																	
-Clay Belt:																	
Cochrane	(5)	135.8	107.8	79.0	59.1	40.4	61.2	31.6	34.7	28.5	33.2	23.7	31.0	15.4	21.8	23.9	20.1
Nipissing	116.3	103.3	88.7	99.2	75.3	51.5	54.7	34.6	26.0	24.2	25.9	19.1	23.8	23.4	18.2	17.4	21.0
Timiskaming	125.0	87.0	92.0	58.7	54.7	54.3	36.0	35.6	35.5	26.3	37.2	32.2	33.3	27.8	33.3	25.0	23.4
-Nickel Range:																	
Manitoulin	88.6	91.7	94.5	70.0	64.2	45.3	45.3	49.5	22.9	44.8	14.9	12.1	13.3	32.4	39.8	27.8	14.9
Sudbury	80.9	90.8	93.9	81.9	53.6	44.1	34.0	27.5	23.4	29.6	24.3	23.5	22.0	23.4	21.2	20.5	18.1
-Sault:																	
Algoma	103.6	96.4	60.0	52.9	53.3	49.6	27.7	25.1	22.0	25.8	21.7	24.4	21.3	22.3	25.1	24.1	21.6
<b>RTHWESTERN ONTARIO</b>																	
Kenora	46.5	108.8	68.8	41.1	46.3	82.4	68.6	62.0	41.7	45.0	35.8	31.8	35.3	25.8	45.1	36.4	37.9
Rainy River	72.8	79.2	86.4	25.3	54.4	39.7	31.3	39.5	41.5	33.1	42.3	29.8	36.2	20.8	26.7	23.9	23.8
Thunder Bay	111.9	88.0	70.0	50.7	58.3	34.4	23.3	31.0	22.5	27.8	28.3	20.8	20.4	19.0	23.3	17.5	15.2

*Cochrane not a county in 1921*

Table E—Death Rates per 1,000 Population, by Cause, Ontario, 1961-1969

Males										
Causes	Age Groups	1961	1962	1963	1964	1965	1966	1967	1968	1969
Accidental and Violent	1— 4	.44	.47	.39	.34	.37	.40	.42	.34	.34
	5—14	.30	.33	.34	.34	.33	.32	.27	.29	.29
	15—24	.96	.92	1.02	.96	1.03	1.02	1.11	1.09	1.09
	25—34	.76	.85	.87	.83	.78	.88	.85	.83	.83
	35—64	1.04	.96	1.08	.99	1.01	.99	1.02	1.05	1.05
	65+	2.09	2.04	2.03	1.97	2.15	2.19	2.17	2.08	2.08
Congenital Malformations	1— 4	.17	.13	.15	.11	.08	.13	.12	.07	.07
	5—14	.04	.03	.04	.03	.02	.02	.03	.02	.02
	15—24	.03	.02	.03	.03	.04	.02	.02	.02	.02
	25—34	.02	.02	.03	.03	.02	.02	.02	.01	.01
	35—64	.02	.03	.03	.03	.03	.02	.02	.02	.02
	65+	.03	.03	.04	.03	.01	.03	.05	.06	.06
Neoplasms	1— 4	.12	.11	.13	.15	.09	.09	.15	.09	.09
	5—14	.10	.08	.08	.07	.08	.07	.08	.08	.08
	15—24	.10	.12	.09	.09	.11	.11	.09	.08	.08
	25—34	.19	.20	.19	.16	.13	.15	.14	.15	.15
	35—64	1.71	1.76	1.78	1.72	1.69	1.78	1.76	1.72	1.72
	65+	11.68	11.96	11.70	11.81	11.87	12.28	12.98	12.45	13.45
Nervous System Disease	1— 4	.07	.09	.07	.07	.04	.05	.05	.04	N
	5—14	.02	.05	.02	.02	.02	.03	.03	.02	N
	15—24	.05	.03	.03	.04	.04	.03	.04	.02	N
	25—34	.05	.07	.05	.05	.08	.06	.07	.04	N
	35—64	.58	.56	.52	.57	.50	.50	.53	.50	N
	65+	10.28	10.56	10.29	9.53	10.11	9.60	9.13	8.89	N
Circulatory System Disease (Heart Disease)	1— 4	.00	.00	.00	.01	.00	.00	.00	.00	.00
	5—14	.01	.00	.01	.00	.00	.01	.01	.01	.01
	15—24	.04	.03	.03	.02	.03	.02	.03	.03	.03
	25—34	.13	.13	.16	.14	.15	.10	.10	.09	.09
	35—64	4.16	4.14	4.08	4.15	4.23	4.05	4.13	3.84	4.13
	65+	36.45	36.07	36.86	35.44	37.26	36.29	35.35	35.27	42.17
Respiratory System Disease	1— 4	.13	.16	.24	.15	.14	.12	.15	.10	.10
	5—14	.03	.03	.03	.03	.03	.02	.03	.03	.03
	15—24	.03	.04	.04	.03	.04	.04	.03	.02	.02
	25—34	.04	.04	.05	.06	.03	.05	.03	.04	.04
	35—64	.31	.32	.35	.33	.14	.36	.40	.39	.39
	65+	4.33	4.55	6.04	4.57	5.64	6.03	5.79	6.39	6.39

\*Category changed in 1969



Table E—Death Rates per 1,000 Population, by Cause, Ontario, 1961-1969—Continued

Females										
Causes	Age Groups	1961	1962	1963	1964	1965	1966	1967	1968	1969
Accidental Violent	1—4	.29	.29	.26	.22	.28	.27	.28	.28	.20
	5—14	.12	.11	.15	.13	.13	.16	.17	.14	.12
	15—24	.22	.22	.26	.23	.25	.25	.30	.29	.29
	25—34	.20	.23	.23	.23	.19	.22	.23	.23	.24
	35—64	.29	.31	.32	.33	.37	.37	.37	.39	.40
	65+	1.63	1.80	1.57	1.34	1.56	1.38	1.43	1.37	1.29
Genital formations	1—4	.12	.13	.14	.11	.12	.08	.11	.11	.15
	5—14	.04	.03	.03	.03	.02	.03	.04	.03	.03
	15—24	.03	.02	.01	.02	.02	.01	.02	.01	.01
	25—34	.02	.02	.01	.02	.02	.02	.02	.02	.01
	35—64	.02	.02	.02	.02	.02	.03	.02	.02	.02
	65+	.03	.03	.02	.03	.04	.02	.02	.01	.03
Neoplasms	1—4	.09	.09	.09	.09	.10	.11	.09	.08	.07
	5—14	.05	.07	.07	.06	.05	.06	.07	.05	.07
	15—24	.06	.05	.08	.06	.06	.07	.07	.06	.05
	25—34	.16	.18	.23	.18	.14	.16	.15	.14	.14
	35—64	1.62	1.71	1.64	1.60	1.73	1.63	1.68	1.63	1.70
	65+	7.55	7.70	7.70	7.50	7.71	7.38	7.50	7.38	7.63
Infectious Disease	1—4	.06	.04	.03	.02	.04	.05	.04	.04	N.A.*
	5—14	.03	.03	.01	.02	.01	.02	.02	.01	N.A.
	15—24	.02	.03	.03	.03	.02	.02	.02	.01	N.A.
	25—34	.08	.04	.05	.04	.03	.05	.03	.04	N.A.
	35—64	.52	.47	.47	.50	.44	.44	.38	.39	N.A.
	65+	11.11	10.36	10.03	9.22	9.70	9.05	8.33	8.27	N.A.
Respiratory Disease (Heart Disease)	1—4	.00	.01	.00	.00	.01	.00	.00	.00	.01
	5—14	.01	.00	.00	.00	.01	.01	.01	.01	.01
	15—24	.03	.03	.03	.01	.03	.02	.01	.01	.02
	25—34	.07	.09	.05	.08	.07	.08	.05	.04	.09
	35—64	1.29	1.32	1.29	1.27	1.23	1.26	1.20	1.20	1.51
	65+	26.08	26.30	26.50	25.82	25.73	25.02	25.00	24.69	31.68
Respiratory Disease	1—4	.12	.17	.14	.13	.11	.12	.10	.08	.09
	5—14	.03	.02	.04	.02	.02	.03	.03	.02	.02
	15—24	.02	.01	.02	.02	.03	.02	.02	.03	.03
	25—34	.05	.03	.05	.02	.03	.04	.02	.03	.04
	35—64	.12	.13	.17	.14	.14	.16	.15	.14	.19
	65+	2.74	2.94	3.39	2.35	2.80	2.93	2.63	3.11	2.84

Category changed in 1969

Table F—Causes of Death, by Sex and Region, Ontario, 1966

			Total	Rate per	Eastern	Rate per	Rate per	Rate per	Rate per	Rate per	Rate per	
			Ontario	100,000	Ontario	100,000	Lake	100,000	Central	100,000	100,000	
				Pop'n		Pop'n	Ontario	Pop'n	Ontario	Pop'n	Niagara	
											Pop'n	
I	Infective & Parasitic Diseases	T	54,171	778.22	6,839	803.72	3,132	892.55	17,648	705.37	6,666	793.40
		M	31,142	895.10	3,820	902.12	1,782	1,014.32	9,912	799.42	3,820	911.80
		F	23,029	661.43	3,019	706.24	1,350	770.47	7,736	612.96	2,846	675.60
	A1-5 Tuberculosis	T	304	4.37	46	5.41	18	5.13	93	3.72	35	4.17
		M	182	5.23	23	5.43	11	6.26	59	4.76	21	5.07
		F	122	3.50	23	5.38	7	4.00	34	2.69	14	3.32
	A6-11 Venereal Diseases	T	132	1.90	20	2.35	7	1.99	38	1.52	10	1.19
		M	79	2.27	8	1.89	5	2.85	25	2.02	7	1.67
		F	53	1.52	12	2.81	2	1.14	13	1.03	3	0.77
	A12-43 Other	T	35	0.50	3	0.35	2	0.57	10	0.40	8	0.99
		M	23	0.66	1	0.24	1	0.57	8	0.65	4	0.99
		F	12	0.34	2	0.47	1	0.57	2	0.16	4	0.99
	II Malignant Neoplasms	T	9,607	138.01	1,129	132.68	489	139.35	3,499	139.85	1,203	143.17
		M	5,272	151.53	589	139.10	275	156.53	1,878	151.46	680	162.30
		F	4,335	124.51	540	126.32	214	122.13	1,621	128.44	523	124.17
III & IV Allergic Disorders & Endocrine, Metabolic & Blood Diseases	T	1,272	18.27	140	16.45	84	23.94	380	15.19	177	21.07	
	M	617	17.73	67	15.82	42	23.91	187	15.08	80	19.17	
	F	655	18.81	73	17.08	42	23.97	193	15.29	97	23.07	
V Mental Psychoneurotic & Personality Disorders	T	181	2.60	24	2.82	10	2.85	66	2.64	20	2.39	
	M	108	3.10	15	3.54	4	2.28	36	2.90	12	2.89	
	F	73	2.10	9	2.11	6	3.42	30	2.38	8	1.99	
VI Diseases of the Nervous System & Sense Organs	T	6,491	93.25	783	92.02	461	131.38	1,963	78.46	871	103.60	
	M	3,047	87.58	379	89.50	218	124.09	865	69.76	407	97.17	
	F	3,444	98.92	404	94.51	243	138.68	1,098	87.00	464	110.17	
VII Diseases of the Circulatory System	T	23,032	330.88	2,966	348.56	1,317	375.32	7,502	299.85	2,780	330.80	
	M	13,644	392.16	1,679	396.51	793	451.38	4,370	352.45	1,637	390.70	
	F	9,388	269.64	1,287	301.07	524	299.06	3,132	248.16	1,143	271.30	
VIII Diseases of the Respiratory System	T	3,402	48.87	498	58.52	213	60.70	1,034	41.33	411	48.90	
	M	2,136	61.39	283	66.83	117	66.60	668	53.88	257	61.30	
	F	1,266	36.36	215	50.30	96	54.79	366	29.00	154	36.50	
IX Diseases of the Digestive System	T	1,959	28.14	268	31.50	91	25.93	671	26.82	265	31.20	
	M	1,102	31.67	147	34.72	41	23.34	369	29.76	146	34.80	
	F	857	24.61	121	28.31	50	28.54	302	23.93	119	28.50	
X Diseases of the Genito-Urinary System	T	806	11.58	96	11.28	49	13.96	239	9.55	94	11.50	
	M	495	14.23	61	14.41	33	18.78	143	11.53	56	13.50	
	F	311	8.93	35	8.19	16	9.13	96	7.61	38	9.00	
XI Deliveries & Complications of Pregnancy, Childbirth and the Puerperium	T	36	0.52	2	0.24	2	0.57	11	0.44	4	0.50	
	M	—	—	—	—	—	—	—	—	—	—	
	F	36	1.03	2	0.47	2	1.14	11	0.87	4	0.50	
XII & XIII Diseases of the Skin & Musculo-skeletal System	T	213	3.06	29	3.41	12	3.42	72	2.88	33	3.40	
	M	86	2.47	8	1.89	7	3.98	26	2.10	16	3.40	
	F	127	3.65	21	4.91	5	2.85	46	3.64	17	4.00	



	Rate per 100,000 Pop'n	Lake St. Clair	Rate per 100,000 Pop'n	Mid- western Ontario	Rate per 100,000 Pop'n	Georgian Bay	Rate per 100,000 Pop'n	North- eastern Ontario	Rate per 100,000 Pop'n	North- western Ontario	Rate per 100,000 Pop'n
3	879.86	4 055	835.11	3,467	814.28	3,286	1,002.00	3,468	671.80	1,757	786.19
3	1,003.81	2,405	990.49	1,945	910.62	1,864	1,122.59	2,261	850.38	1,160	996.81
0	758.69	1,650	679.70	1,522	717.30	1,422	878.33	1,207	482.13	597	557.36
7	6.17	18	3.71	12	2.82	9	2.74	29	5.62	17	7.61
9	8.78	8	3.29	6	2.81	5	3.01	19	7.15	11	9.45
8	3.61	10	4.12	6	2.83	4	2.47	10	3.99	6	5.60
2	2.74	9	1.85	5	1.17	4	1.22	19	3.68	8	3.58
7	3.23	4	1.65	2	0.94	3	1.81	13	4.89	5	4.30
5	2.26	5	2.06	3	1.41	1	0.62	6	2.40	3	2.80
4	0.91	1	0.21	2	0.47	1	0.30	3	0.58	1	0.45
3	1.39	—	—	2	0.94	1	0.60	2	0.75	1	0.86
1	0.45	1	0.41	—	—	—	—	1	0.40	—	—
1	2.51	8	1.65	5	1.17	4	1.22	7	1.36	8	3.58
9	4.16	4	1.65	2	0.94	1	0.60	4	1.50	5	4.30
2	0.90	4	1.65	3	1.41	3	1.85	3	1.20	3	2.80
6	138.38	683	140.66	600	140.92	499	152.16	599	116.03	300	134.24
0	161.68	390	160.62	310	145.14	259	155.98	357	134.27	184	158.11
6	115.61	293	120.70	290	136.67	240	148.24	242	96.67	116	108.30
5	21.69	113	23.27	73	17.15	80	24.39	104	20.15	26	11.63
6	21.25	55	22.65	36	16.85	42	25.29	49	18.43	13	11.17
9	22.13	58	23.89	37	17.44	38	23.47	55	21.97	13	12.14
8	1.83	9	1.85	11	2.58	6	1.83	19	3.68	8	3.58
4	1.85	9	3.75	6	2.81	4	2.41	10	3.76	8	6.87
4	1.81	—	—	5	2.36	2	1.24	9	3.59	—	—
9	120.80	462	95.15	483	113.44	436	132.95	326	63.15	177	79.20
4	112.71	243	100.08	221	103.47	196	118.04	176	66.20	98	84.21
5	128.71	219	90.21	262	123.48	240	148.24	150	59.92	79	73.75
4	373.14	1,763	363.08	1,459	342.67	1,528	465.93	1,391	269.45	692	309.64
0	429.61	1,061	436.97	843	394.68	905	545.03	941	353.92	485	416.77
4	317.93	702	289.18	616	290.31	623	384.81	450	179.75	207	193.25
8	56.63	269	55.40	202	47.44	196	59.77	197	38.16	134	59.96
7	72.53	184	75.78	125	58.52	114	68.66	146	54.91	85	73.04
1	41.10	85	35.01	77	36.29	82	50.65	51	20.37	49	45.75
0	29.69	152	31.30	119	27.95	77	23.48	123	23.83	63	28.19
9	31.87	87	35.83	77	36.05	45	27.10	82	30.84	39	33.51
1	27.55	65	26.78	42	19.79	32	19.77	41	16.38	24	22.41
7	15.30	60	12.36	58	13.62	52	15.86	64	12.40	27	12.08
4	15.71	34	14.00	38	17.79	33	19.87	45	16.92	18	15.47
3	14.90	26	10.71	20	9.43	19	11.74	19	7.59	9	8.40
2	0.46	2	0.41	1	0.23	1	0.30	8	1.55	3	1.34
—	—	—	—	—	—	—	—	—	—	—	—
2	0.90	2	0.82	1	0.47	1	0.62	8	3.20	3	2.80
2	2.74	18	3.71	11	2.58	10	3.05	10	1.94	6	2.68
3	1.39	9	3.71	2	0.94	6	3.61	6	2.26	3	2.58
9	4.06	9	3.71	9	4.24	4	2.47	4	1.60	3	2.80

Table F—Causes of Death, by Sex and Region, Ontario, 1966—Continued

[illegible]

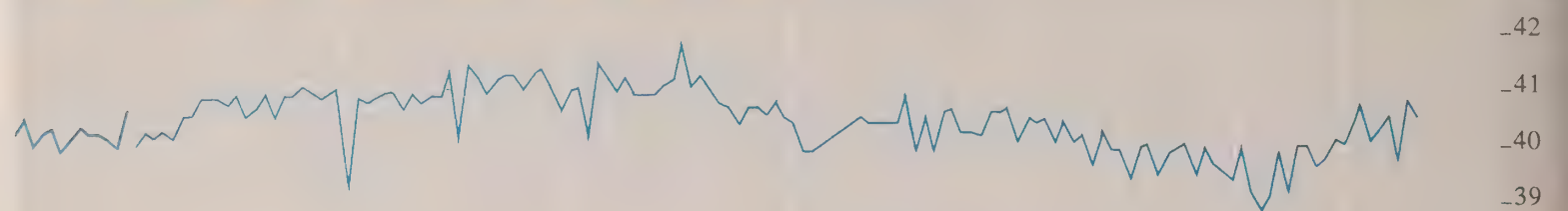


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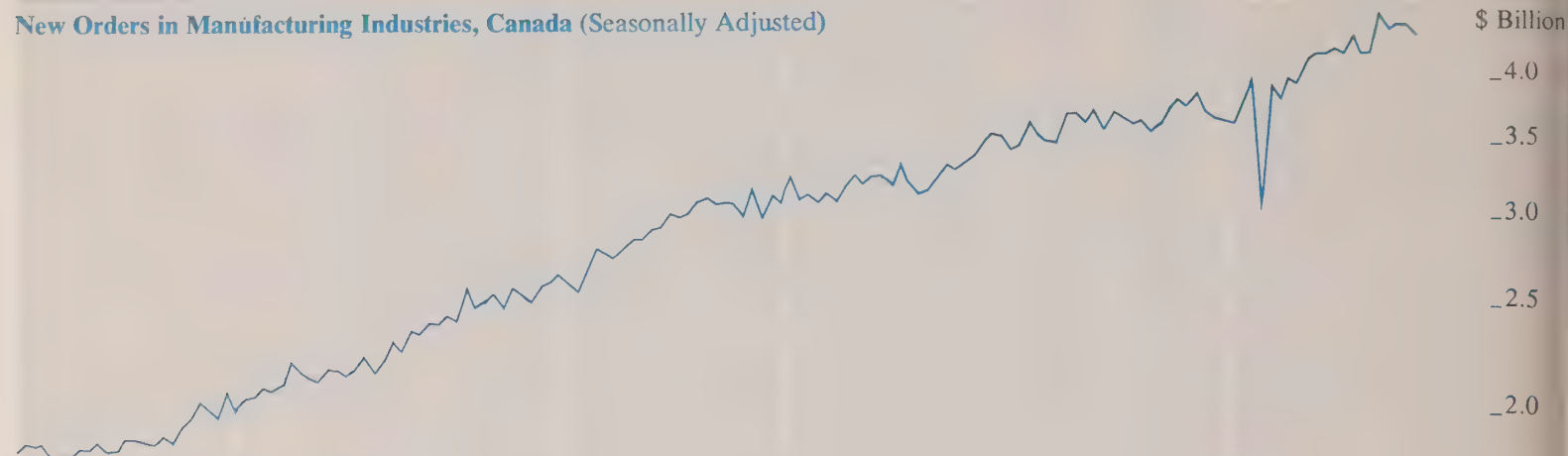
# Selected Economic Indicators

## Leading Indicators

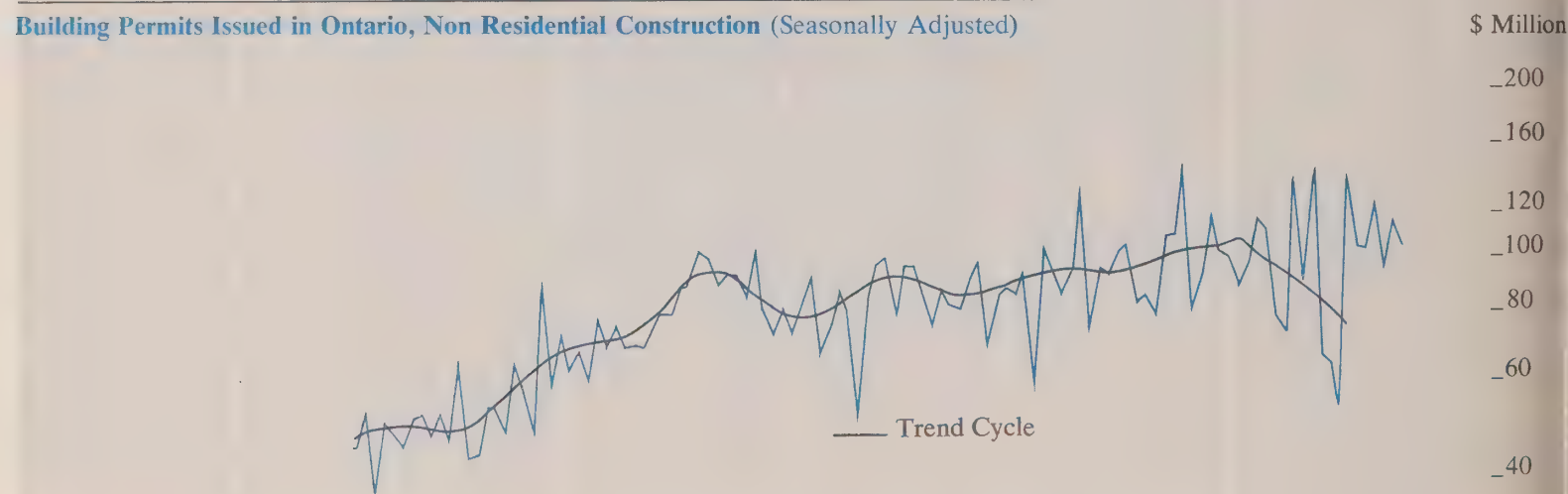
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



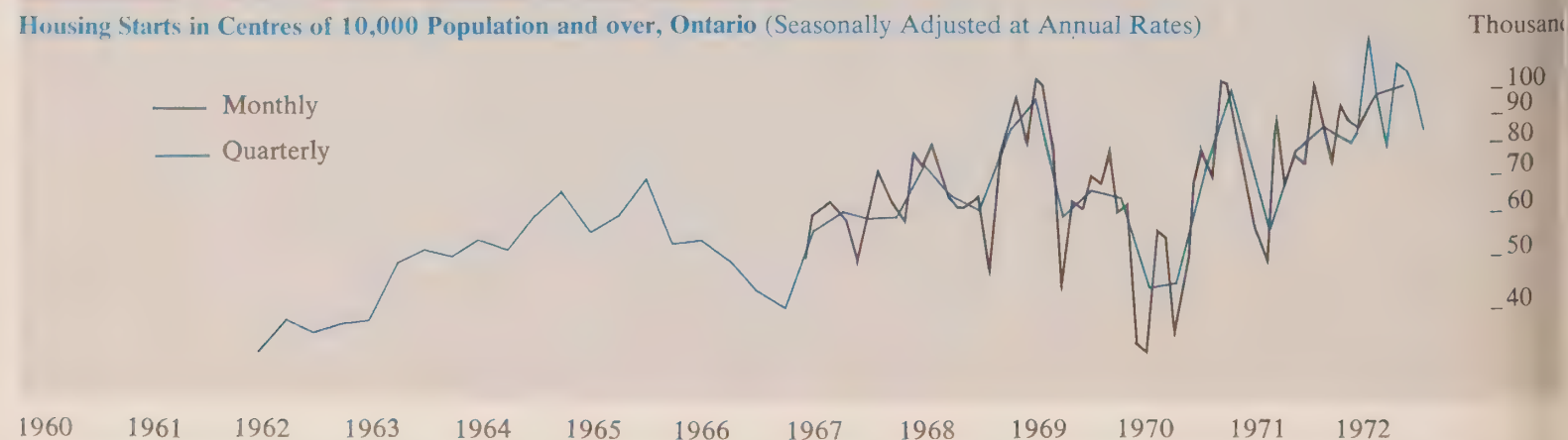
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)





## Leading Indicators

**Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

Scale L1  
\$ Billion  
\_35  
\_30  
\_25  
\_20  
\_15

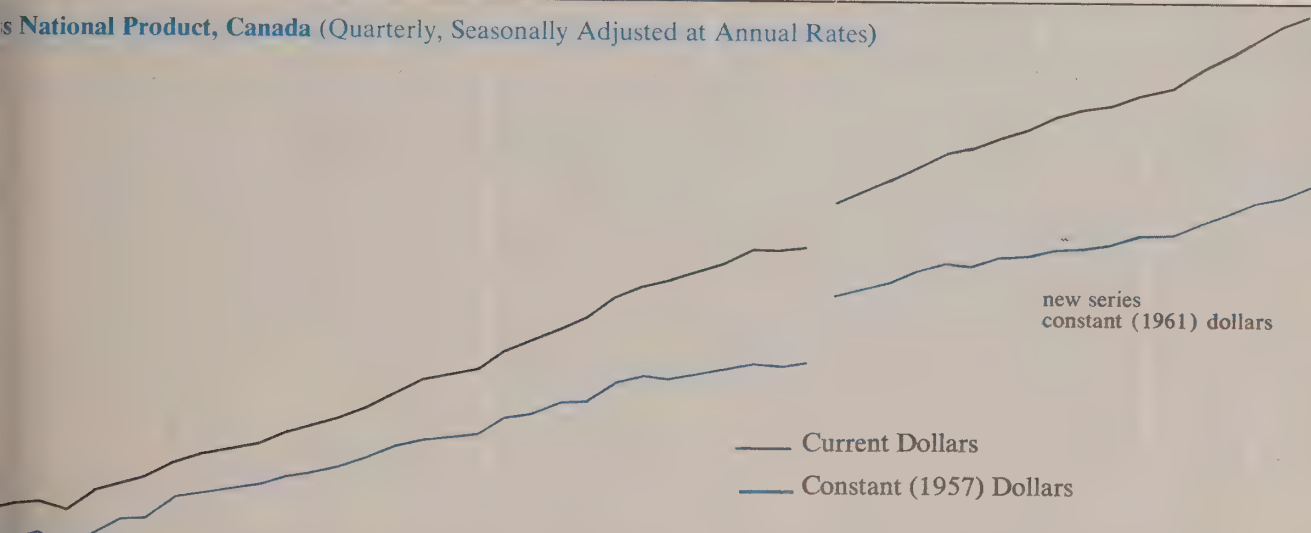
**Ontario Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Scale L2  
Index  
\_200  
\_180  
\_160  
\_140  
\_120  
\_100

## Incidental and Lagging Indicators

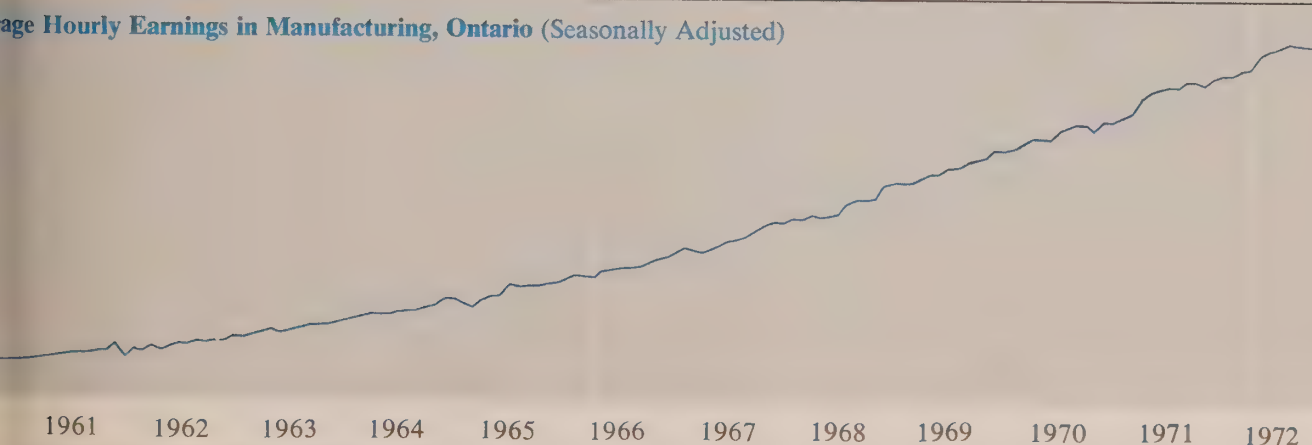
**Canada's National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

Scale L1  
\$ Billion  
\_90  
\_80  
\_70  
\_60  
\_50  
\_40  
\_35



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Scale L1  
Dollars  
\_3.50  
\_3.00  
\_2.50  
\_2.00



1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

# Coincidental and Lagging Indicators

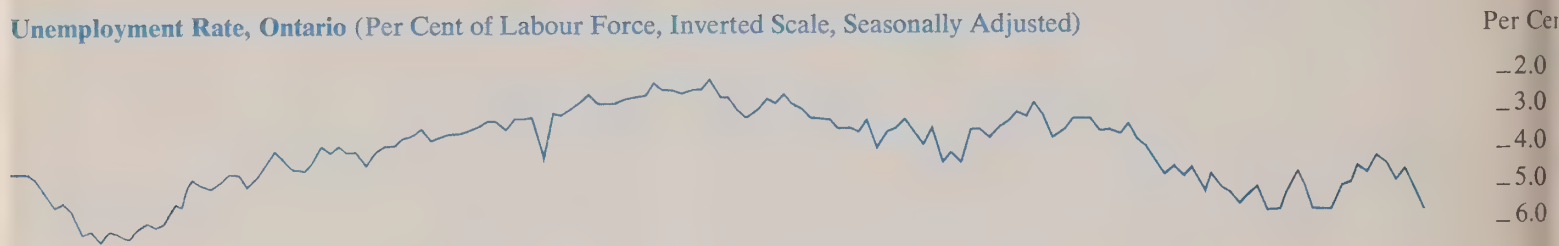
Average Yield of 3-Month Treasury Bills, Canada (Last Wednesday of the Month, Not Seasonally Adjusted)



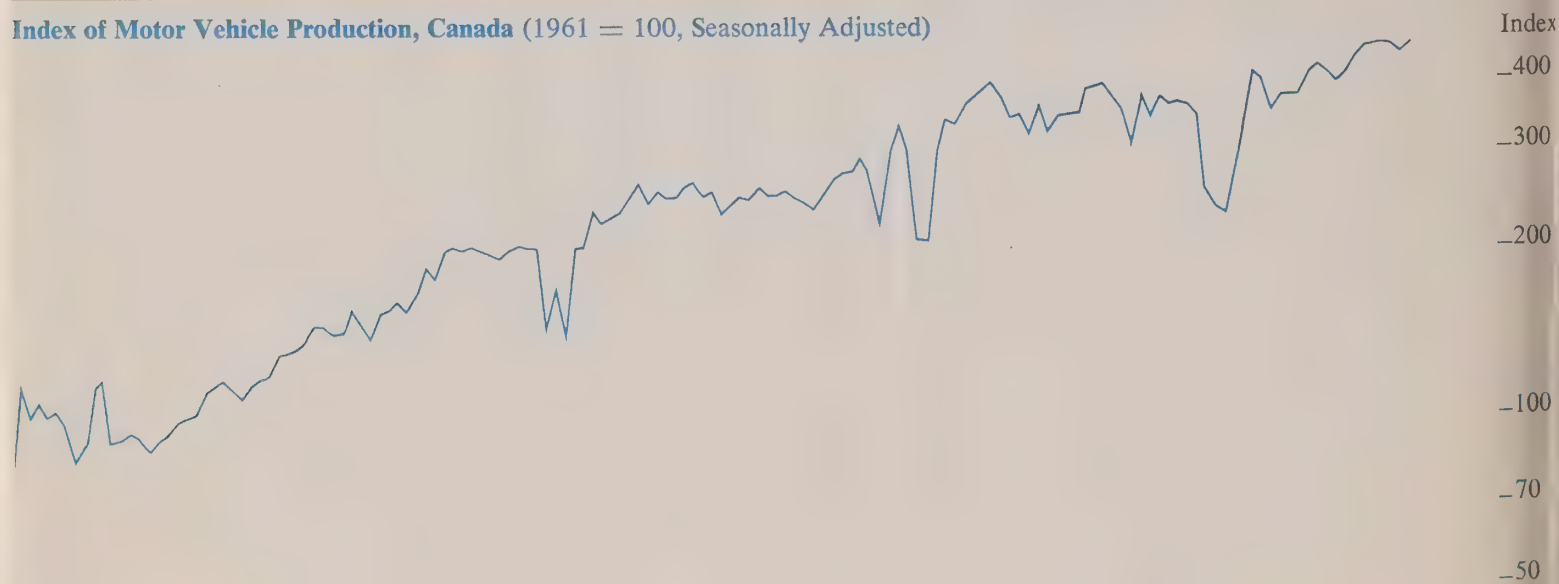
Employment, Ontario (Seasonally Adjusted)



Unemployment Rate, Ontario (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



Index of Motor Vehicle Production, Canada (1961 = 100, Seasonally Adjusted)



1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972



	1971						1972							
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
Leading Indicators														
Average Weekly Hours Worked in Manufacturing	39.8	39.8	39.8	40.0	40.0	40.4	40.7	40.1	40.2	40.5	39.7	40.8	40.5	
New Orders in Manufacturing Industries <sup>c</sup>	3,993.7	4,267.3	4,334.7	4,216.9	4,267.0	4,216.1	4,368.1	4,213.4	4,234.7	4,563.0	4,439.8	4,488.0	4,459.5	4,381.7
Building Permits Issued in Ontario, Non-Residential Construction	92.6	146.2	67.3	64.6	53.1	139.6	103.4	102.5	123.2	95.1	114.7	104.7	76.7	
Urban Housing Starts (Annual Rate)	73,000	99,400	82,900	73,600	98,500	77,500	82,900	123,100	94,000	78,700	108,600	106,700	97,000	82,700
Money Supply <sup>c</sup>	35,009	35,456	35,978	36,406	36,964	37,423	38,287	38,680	39,120	39,689	40,646	40,774	40,855	41,243
T.S.E. Industrial Index <sup>u</sup>	177.5	176.3	169.9	160.8	166.2	181.6	197.3	203.6	197.7	200.0	204.0	199.7	204.8	214.1
Business Failures <sup>u</sup>	60	55	40	78	94	61	44	61	135	78	153	94	—	101
Business Failures — Liabilities <sup>u</sup>	8.0	5.3	2.1	5.6	5.7	3.7	3.4	4.7	8.7	9.0	7.7	4.3	—	7.4
Coincidental and Lagging Indicators														
Gross National Product <sup>c</sup> (Annual Rate)			94,644			96,596			99,152			102,092		
Average Hourly Earnings in Manufacturing	3.46	3.47	3.49	3.51	3.52	3.53	3.62	3.66	3.66	3.70	3.69	3.68	3.67	
3-Month Treasury Bill Rate <sup>c,u</sup>	3.68	3.79	4.06	3.47	3.24	3.21	3.36	3.45	3.57	3.64	3.73	3.50	3.46	3.50
Cheques Cashied in Clearing Centres <sup>1</sup>	7,457	7,843	7,988	8,291	8,248	8,098	7,627	7,940	7,508	8,010	7,409	8,144	8,437	
Retail Trade	983	972	1,000	1,001	1,030	1,013	1,033	1,036	1,032	1,085	1,093	1,080	1,102	
Labour Force	3,231	3,244	3,285	3,304	3,321	3,324	3,359	3,325	3,373	3,349	3,372	3,362	3,373	3,392
Employed	3,081	3,080	3,106	3,118	3,136	3,159	3,197	3,174	3,216	3,208	3,225	3,200	3,221	3,220
Unemployed	150	164	179	186	185	165	162	151	157	141	147	162	152	172
Unemployed as % of Labour Force	4.6	5.1	5.4	5.6	5.6	5.0	4.8	4.5	4.7	4.2	4.4	4.8	4.5	5.1
Wages and Salaries	1,744	1,763	1,775	1,771	1,782	1,786								
Index of Industrial Employment	132.6	132.2	132.8	132.2	131.2	131.5	131.9	132.1	133.2	133.9	134.8	134.8	134.2	132.3
Index of Industrial Production <sup>c</sup>	182.5	186.1	188.2	188.1	187.5	187.8	189.4	189.5	191.1	195.1	192.8	194.0	193.8	192.3
Total Manufacturing <sup>c</sup>	178.7	182.3	185.0	185.6	184.0	184.3	186.1	185.0	187.1	191.0	188.3	190.9	191.4	190.1
Non-Durables <sup>c</sup>	160.8	162.4	163.8	164.7	163.4	163.7	164.5	162.9	165.4	169.4	167.5	172.0	170.5	169.8
Durables <sup>c</sup>	201.2	207.5	211.7	212.0	210.1	210.3	213.3	213.1	214.6	218.4	214.6	214.8	217.8	215.7
Mining <sup>c</sup>	191.2	191.7	191.4	188.1	190.2	190.6	192.2	194.9	193.3	200.8	197.2	189.3	185.5	182.0
Electric Power and Gas Utilities <sup>c</sup>	202.4	209.7	211.1	209.1	213.3	213.8	213.5	218.8	221.9	221.3	224.3	228.2	228.2	227.8
Primary Energy Demand (Annual Rate)	67.33	69.82	71.13	68.06	70.26	68.83	70.19	72.37	72.63	72.07	71.74			
Exports (including re-exports) <sup>c</sup>	1,472	1,553	1,517	1,526	1,507	1,508	1,483	1,577	1,553	1,555	1,670	1,749	1,482	1,585
Imports <sup>c</sup>	1,324	1,378	1,275	1,462	1,387	1,362	1,494	1,443	1,519	1,511	1,534	1,540	1,524	1,521
Unclassified Indicators														
Foreign Exchange Reserves <sup>c,u</sup>	4,056	4,319	4,308	4,379	4,573	4,852	4,838	4,841	4,903	5,005	5,210	5,376	5,349	5,358
Industrial Materials Price Index <sup>c,u</sup>	266.7	266.8	265.6	266.4	267.9	269.8	277.1	282.8	291.7	290.6	294.5	295.7	294.9	300.9
Consumer Price Index <sup>c,u</sup>	134.1	135.0	134.7	134.9	135.4	136.3	136.7	137.3	137.4	138.2	138.3	138.5	140.2	141.3
Toronto <sup>u</sup>	130.2	130.6	130.7	130.2	130.5	131.6	132.0	132.8	132.6	133.4	133.4	133.9	135.7	135.9
Ottawa <sup>u</sup>	131.8	132.0	131.7	131.6	132.3	133.0	133.6	133.9	134.1	135.1	134.7	134.9	136.1	137.4
Thunder Bay <sup>u</sup>	104.2	104.6	105.2	104.8	104.9	105.4	105.8	106.3	106.3	107.0	107.1	106.6	107.2	108.4
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>	0.75	0.74	0.74	0.74	0.74	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.







# Ontario Economic Review

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Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. Charles S. MacNaughton, Treasurer of Ontario  
and Minister of Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

November/December 1972  
Volume 10, Number 5

## Federal-Provincial Shared-Cost Programs in Ontario

Taxation and Fiscal Policy Branch,  
Ministry of Treasury, Economics and Intergovernmental Affairs

## Rates of Return and Taxation from Private Capital in Canada

Glenn P. Jenkins, *Consultant*  
Economic Planning Branch

## Selected Economic Indicators

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A publication of the  
Ministry of Treasury, Economics  
and Intergovernmental Affairs  
Government of Ontario

**Hon. Charles S. MacNaughton**  
*Treasurer of Ontario and  
Minister of Economics and  
Intergovernmental Affairs*

**H. Ian Macdonald**  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

Subscriptions can be obtained free of charge by writing the Editor, *Ontario Economic Review*, Ministry of Treasury, Economics and Intergovernmental Affairs, Frost Building, Queen's Park, Toronto, Ontario, M7A 1Y7.

*During the recent reorganization of the Ministry of Treasury, Economics and Intergovernmental Affairs, two editions of the Ontario Economic Review (November/December 1972 and January/February 1973) were not published.*

*The November/December edition has now been printed, and preparation of the January/February issue is underway. Publication of these two issues will thereby provide continuity for the Review, and the Review will continue to be published on a bimonthly basis.*

### About the Review

The absence of the profit motive in the public sector has always made the evaluation of long-range projects more difficult than in the private sector. The criterion for capital investment by private corporations is the profitability of a given project. In the public sector, since social implications are involved, no similar straight-forward criterion exists.

A critical element in any project evaluation is the rate used for discounting future costs and benefits.

Dr. Jenkins's article, featured in the November/December edition of the *Ontario Economic Review*, contributes significantly to the understanding of the problems involved in choosing an appropriate discount rate for the public sector. The article traces the development of the determination of the rates of return to capital of various sectors in the Canadian economy. While these rates were developed on a national basis, they can apply equally to projects undertaken by the Ontario Government, other provincial governments and crown corporations.

The article on shared-cost programs provides a preliminary indication of the number and scope of arrangements between federal and provincial departments which now affect almost all fields of provincial responsibility. It can be seen that cost sharing not only earmarks annually a considerable portion of the Ontario budget but also creates a greatly varied and highly complex set of administrative relationships.

This article was prepared under the direction of Mr. D. M. Allan in the Taxation and Fiscal Policy Branch, Ministry of Treasury, Economics and Intergovernmental Affairs.

### Indicator Charts, Pages 20-22

Fluctuations in aggregate economic activity—commonly used to define business cycles—do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate—because they relate to future rather than present production—are referred to as leading indicators and are widely used to anticipate the short-future course of the overall economy. The charts on pages 20, 21 and 22 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used—'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance—only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



# Federal-Provincial Shared-Cost Programs in Ontario

Information and Fiscal Policy Branch,  
Ministry of Treasury, Economics and Intergovernmental Affairs

## INTRODUCTION

Since 1867 the federal government has assumed the major responsibility for fiscal policy in Canada. One aspect of that function has been the redistribution of fiscal resources and economic activity among governments and regions throughout the country. Over the years this role has commanded a growing proportion of federal budgetary allocations to a point today where transfer policies encompass a considerable range of methods including unconditional grants, tax sharing, regional expansion programs, cost sharing, equalization payments and public works projects. Five major federal policies — equalization, regional economic expansion, statutory subsidies, conditional grants and public works — will now distribute almost \$5 billion throughout Canada in 1972.

Provinces have been interested both in the magnitude of federal transfers and in the mechanisms involved since they can either strengthen or attenuate the autonomy of provincial governments in the federation. Indeed, Ontario has made comments and suggestions over the last few years on this issue of federal redistributive policy. Both in annual budget statements<sup>1</sup> and at federal-provincial conferences<sup>2</sup> the Province has indicated its general concern, along with that of other provinces, for an open and comprehensive assessment of federal programs in this policy area.

A clear trend in federal transfer policy has become evident. There has been a move away from sole reliance upon unconditional financial transfers — statutory subsidies and equalization payments — and a rapid increase in conditional transfers via the shared-cost program mechanism. In 1972, shared-cost payments to the provinces will amount to \$1.5 billion, or 65 per cent of total redistributive spending.

It is not merely the sheer size and expansion of conditional grants that warrant attention. More important, they exert enormous leverage on planning, prioritizing and financing both for the provinces and the national government. They also create serious problems of policy, financial, and administrative control. It is the characteristics of budgetary leverage and operational inflexibility which make conditional grants less suitable than alternative means of transferring revenues, such as tax sharing or unconditional financial transfers. At the same time, shared-cost programs have demonstrated evident merit in terms

of establishing social advances and achieving national levels of essential public services. In light of these advantages and disadvantages, it is appropriate to undertake a periodic stocktaking and evaluation of shared-cost programs.

It is the purpose of a new Ontario Staff Paper<sup>3</sup> to examine the budgetary problems that arise from cost sharing in general. In particular, it considers the issues of control, rigidities and accountability. The method followed is to provide a brief history of federal transfers, noting especially the emergence of conditional grants and their distinctive features. This is followed by an evaluation of existing shared-cost programs in Ontario from which several conclusions concerning federal-provincial conditional grants are drawn. An appendix provides a detailed descriptive inventory of the fifty-three joint programs currently in effect.

## II—BACKGROUND OF COST SHARING Initial Transfers

Almost from the year of Confederation the central government was called upon to exercise its role as guardian of the economic and fiscal well-being of the provinces. While this was a deliberate aim of the Constitution, few had anticipated that the provinces' revenues would be so inadequate or that their needs would be so explosive as to require almost immediate federal aid.

In this situation, the central government had no clear philosophy to govern its response to provincial requests for more and more financial assistance. The confusion that reigned until the early twentieth century led to federal transfers on the most ad hoc and arbitrary of reasoning, guided by a notion of Victorian frugality. Statutory payments originally had been established on a variety of criteria, all unrelated to the present or future expenditure needs of the provinces or the growing evidence of financial and economic disparities among regions.

Until 1912, additions to these initial subsidies were made largely upon advocacy and rarely upon any objective measure of fiscal need or capacity. In 1912, these unconditional statutory subsidies ceased to grow sporadically and instead were related to a number of factors which provided each province with a basic — though very low — financial floor. There has been little change in this principle since that date.<sup>4</sup>

### Cost Sharing

Such a settlement was no solution to the discrepancies between provinces in levels of

services. Nor did it provide sufficient funds to finance the rapid growth in the provinces' responsibilities as a result of emerging welfare statism. Motivated by the problems that differences among provinces in hygiene, farm education, technical training and road quality presented, the federal government established grants to the provinces, conditional upon expenditures in these areas. Between 1912 and 1927, federal funds were made available for provincial programs in these fields. While concerned with specific program areas, these grants still lacked any close relationship to actual program costs or standards. Nonetheless, they did constitute tentative and temporary federal assistance to what clearly were acknowledged to be provincial responsibilities. For this reason, federal control of provincial expenditure was cautious or relaxed. Even in 1927 when the Old Age Pensions Act was legislated by the federal government, the initiative for accepting federal money and formulating legislation was left to the provinces. This new scheme did, however, introduce the idea of federal payments related to provincial expenditure rather than to a flat-rate or per capita sum.

During the Depression in the 1930's, conditional grants failed because their own inflexibility and complexity could not provide an adequate response to soaring provincial and municipal welfare costs. Relief payments and employment projects overwhelmed the administrative capacity required by conditional federal transfers and, consequently, many became unconditional subventions. Out of this chaotic situation, as well as the continuing confusion about the proper federal role in assisting the development of the provinces, emerged the Rowell-Sirois Commission<sup>5</sup>. The Commission concluded in 1940 that programs of joint administration had been unsatisfactory. The system of Dominion auditors and inspectors examining provincial accounts and activities often caused divisions and confusion over the lines of accountability and responsibility. Moreover, financial and administrative control requirements imposed by the federal government raised the question of whether a province could indeed set its own priorities and budgets in these areas.<sup>6</sup>

The issue of provincial autonomy and accountability was set aside during and immediately after the war by the federal government. It felt that for reasons of central economic control neither greater tax room nor larger unconditional grants could



be offered in lieu of joint programs. Instead, a wholly new set of conditional grants was proposed and gradually implemented over the next ten years. Since 1946, there have been major programs in welfare, health, resource development, medical care and support for post-secondary education. Collectively, these shared-cost programs account for 22 per cent of the federal budget in 1972. At the provincial level, these conditional transfers represent a major part of provincial financing, ranging from 20 per cent of total expenditures in Ontario to over 45 per cent in the smallest provinces.

### III—PROBLEMS ASSOCIATED WITH CONDITIONAL GRANTS

The 53 shared-cost programs examined in *Federal-Provincial Shared-Cost Programs in Ontario* demonstrate both the merits and drawbacks of joint financing schemes. There can be little doubt that these shared-cost programs have stimulated new or much improved services, particularly in provinces with limited financial resources. Indeed, the attainment of uniform national standards in health, education, welfare and transportation has largely been a result of federal-provincial collaboration and joint financing. Now that the major programs are mature and their initial purposes achieved, however, the question arises whether these conditional transfers should now be replaced by a more flexible and efficient mechanism.

#### A General Problem

One problem is recurrent in conditional grants: they have a tendency to interfere with a province's priority-setting, budgetary planning and efficiency of program delivery. The more stipulations are attached to federal funds, the more fiscal transfers reduce provincial autonomy. By choosing the area of initiative, the federal government can decide which provincial activity it wishes to stimulate and favour over other provincial priorities. Both federal and provincial governments recognize this. For this reason the central government has long emphasized, as did Mr. Sharp in 1966, that cost-sharing agreements should be temporary in duration and replaced with unconditional financing once new programs are established. Otherwise, the continuation of joint programs would imply that the federal government is the primary repository of national values and that its judgement on priorities is superior to that of the provinces.

#### Problems Affecting Budgetary Planning

In addition to the general conceptual

problem of conditional grants, other budgetary and administrative difficulties have been encountered in shared-cost programs. All provincial expenditures should properly be part of a central budgetary plan which reflects the policies and priorities of provincial Cabinets. Yet, it has become evident that shared-cost programs tend to take on an autonomous life of their own, largely outside of provincial budget planning processes. Sustained largely by the program departments responsible for the original initiative and rigidly fixed by federal-provincial agreement for an unstated duration, each program develops its own "clientele" inside and outside government.<sup>7</sup> This makes flexible and independent provincial programming difficult and, in essence, pre-empts large portions of provincial budgetary funds from annual review and adjustment. In 1972, for example, \$2.3 billion or 39 per cent of the Ontario budget was locked into shared-cost programs.

Provincial budgetary planning is also distorted by federal limitations on shared-cost financing such as arbitrary annual ceilings and rigidities in eligibility criteria, although service requirements and program technology change. This inflexibility, in turn, inhibits greater cost efficiencies. For the provinces, the major problem with mature shared-cost programs is to control escalating costs, modernize program delivery and alter spending priorities. It is at this stage — where federal and provincial attitudes diverge over the appropriate scope and mix of policies — that rigid and jointly-regulated schemes become a hindrance to optimal budget planning at both levels of government.

Two current examples can be drawn from the 1972 Staff Paper as illustrations of the problems posed by rigidities in shared-cost agreements in Ontario. A number of provincial commissions and study groups have suggested that nursing education in the province could be improved if the program were to be transferred from the Ministry of Health to the jurisdiction of the Ministry of Colleges and Universities. Although the Province now wishes to undertake such an internal administrative reform, this involves transferring federal cost sharing from the Hospital Insurance and Diagnostic Services Agreement to the Fiscal Arrangements Act, and a potential loss of federal reimbursements for the costs of nursing education. In short, the Province's ability to consider greater efficiency in its services is constrained and retarded by the inflexibility of

federal-provincial agreements.

The Province has also experienced considerable difficulty in securing federal cost sharing under the Canada Assistance Plan, such as for juvenile offenders' training program which is eligible for sharing in all provinces. There has been little disagreement about the "welfare" nature of the program, and hence its eligibility for sharing. But Ottawa insists that all CAP programs be administratively located according to federal stipulations — that is, in the Ministry of Community and Social Services; otherwise cost sharing will not be forthcoming. So far, only a few of the provinces have already combined different departments or at least the services of different departments in order to secure better cost-sharing arrangements under CAP. Theoretically, Ontario could do the same as in the case of some current programs. However, the prime motive for administrative change should be the provision of better and more efficient services rather than qualification for CAP sharing. Even if the administrative difficulties involved were overcome, the effect of organizational changes on the program content could be severe and undesirable. For example, in the case of the training scheme referred to above, it is the opinion of officials involved that a change in administrative jurisdiction such as Ottawa has been suggesting, would lead not to greater integration of the various elements in the correctional process, but rather to increasing fragmentation. At the same rate, the rigid administrative regulations attached to shared-cost agreements have prevented the Province from developing its own departmental organization to provide provincial services according to provincial priorities.

#### Administrative Problems

Specific administrative problems are evident in current shared-cost programs. Generally, they consist of delayed federal payments, auditing difficulties, differences about program aims and eligible costs, abrupt changes in program definition, and unsatisfactory procedures for program review and renewal. In 1971-72, the following programs contained one or more of these problems:

- Agricultural Manpower Agreement
- Agricultural Rural Development Agreement
- Second Language Agreement
- Citizenship and Language Agreements
- Health Resources Fund
- Medical Care Agreement
- National Health Grant



Fisheries Industrial Development  
 Railway Grade Crossing Fund  
 NHA Contribution for Urban Renewal  
 NHA Loans for Land Acquisition and  
 Development  
 NHA Loans for Land Assembly

These differences are probably most obvious when they involve delayed federal reimbursements. The Province commits \$2.3 billion in funds to all shared-cost programs together and can expect about \$1 billion in federal repayments. Any delay in federal payments is at the expense of the Province. While the Province has to submit claims by certain dates, there is no converse obligation on the federal government to be punctual in its repayments or to make interest payments on late reimbursements. Three months after the 1971-72 fiscal year, for instance, the federal government still owed Ontario \$37 million for claims submitted. Delays and difficulties are more critical in some programs than others. Joint programs this year range in size from \$1,740 for weather reporting to \$884,588,316 for hospital insurance. Over half of all these programs spend less than \$1 million each but together account for only 3 per cent of federal reimbursements to Ontario. In these, it appears evident that the internal cost of collecting and submitting claims exceeds the amount of federal reimbursements. In the largest programs, which account for 85 per cent of federal reimbursements, administrative costs are of more reasonable proportions, but repayment delays can be costly. The magnitude of unpaid funds in 1971-72 alone can be seen in the following programs:

Mult Occupational Training	\$7.3 million
Medical Care Agreement	\$7.0 million
Subsidies for Public Housing	\$2.1 million
Hospital Insurance	\$2.0 million
Health Resources Fund	\$1.5 million
Wage Works Projects	\$1.3 million

Intergovernmental liaison and consultation in a number of programs has been unsatisfactory. Indeed, the style of relationship that has developed frequently suggests that the federal government believes it alone should initiate change — an attitude which tends to negate the fact that these are joint programs in primarily provincial jurisdiction.

Often the Province has been faced with abrupt federal notices of ceilings to the sharing of program costs or termination of all or parts of a program. Few agreements have any formal provisions for consultation and most have no specific date or notice of termination. Such imprecision has led to numerous cases of unilateral and arbitrary federal action in a manner suggesting that program design and priorities are primarily matters of federal determination. New program initiatives are frequently announced without meaningful prior consultation with the Province. Also, the Ontario Government has had frequently to accept a definition of eligible costs established by federal auditors rather than through intergovernmental negotiation. In other instances, eligible costs and administrative processes have been defined by verbal agreement — an unsatisfactory situation because, if officials change, nothing remains enshrined in formal regulations.

#### IV—FUTURE TRENDS

From the present study and recent federal proposals<sup>8</sup>, the direction of shared-cost programs for the future seems clear. Generally in new and existing schemes, there is a federal push to terminate open-ended commitments where the level of federal financing is determined by provincial expenditure, and to attach greater interprovincial equalization to the terms of its cost sharing. Grants with such reduced relevance to actual provincial costs become less and less attractive to many provinces. At the same time, federal encouragement of

clientele support groups tends to build up expectations prior to negotiations and to circumscribe the freedom a province has in determining its own priorities.

Far from being a temporary involvement in areas of provincial jurisdiction by provincial consent, conditional grants are increasingly regarded by the central government as legitimate extensions of its authority and as alternatives to greater tax room and unconditional grants. Both conditional grants and unilateral expenditures, such as those of the Department of Regional Economic Expansion<sup>9</sup>, appear to be the federal alternative to the transfer of its surplus revenue capacity to the provinces.

The federal government supports its approach with two arguments. First, the central government maintains that it requires its existing tax capacity for economic stabilization purposes. Second, provincial governments should be publicly accountable by independently raising taxes to meet their expenditure responsibilities. Hence, Ottawa argues it cannot transfer greater tax room to the provinces, but is prepared, where necessary, to aid them through the mechanism of conditional grants. This implies continuing erosion of provincial fiscal integrity and a constant circumscribing of provincial constitutional autonomy, a result which is unacceptable within a modern concept of Canadian federalism.

An earlier Ontario paper discussed alternative methods of transferring federal tax revenues to the provinces.<sup>10</sup> Whether or not tax sharing improves, there still will remain the complexities of joint programs which represent an impediment to proper budgetary management, at both levels of government, in terms of further improving the services involved and achieving greater cost efficiencies. For political, budgetary and administrative reasons, therefore, a reform of financing shared-cost programs is urgently required.

W. Darcy McKeough, Ontario Budget 1971 (Toronto: Department of Treasury and Economics, 1971), pp. 5-9. Also, W. Darcy McKeough, Supplementary Papers on Federal-Provincial Finance, (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972).

W. Darcy McKeough, "The Reconstruction of Economic and Fiscal Policy in Canada," Statement to the Meeting of Ministers of Finance, Ottawa, November 1-2, 1971.

Staff Paper, "Federal-Provincial Shared-Cost Programs in Ontario," Ontario Tax Studies 8 (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, November 1972). This article is an excerpt from the introduction to this paper.

For greater detail of finance and negotiations during this period, see W. Eggleston and R. Craft, "Dominion-Provincial

Subsidies and Grants," Study of the Royal Commission on Dominion-Provincial Relations (Ottawa: King's Printer, 1939).

<sup>5</sup> Canada, Royal Commission on Dominion-Provincial Relations (Ottawa: King's Printer, 1939).

<sup>6</sup> J.M. Corry, "The Difficulties of Divided Jurisdictions," Appendix 7 of the Royal Commission on Dominion-Provincial Relations (Ottawa: King's Printer, 1939).

<sup>7</sup> Clientele groups tend to have a vested interest in the maintenance and growth of a particular program as it sustains a certain administrative system or promotes a particular interest. Their support tends to shield a program from assessment in a broader budgetary context.

<sup>8</sup> In making its proposals for the reform of the National Housing Act, for the extension of support for sport and recreation,

and for new cost sharing of health services, the federal government has made these plans without prior consultation of the provinces. In some instances, Ottawa has bypassed the province and made a policy commitment directly to the ultimate consumer of the shared-cost program. This is the case with NHA reforms: Ottawa has announced new grants to landlords and homeowners for the improvement of their property. However, these grants will only be made if the province agrees to share in half of the cost.

<sup>9</sup> For a study of how DREE represents an abandonment by Ottawa of earlier policies aimed at helping provinces to help themselves in economic growth, see A. Careless, Canadian Federalism and Policies for Regional Development, (unpublished D. Phil. thesis, Oxford University, 1972).

<sup>10</sup> Staff Paper, Intergovernmental Policy Co-ordination and Finance (Toronto: Department of Treasury and Economics, 1970).



# Rates of Return and Taxation from Private Capital in Canada

Glenn P. Jenkins\*

## I—PURPOSE OF THE STUDY

Information on the rates of return and effective rates of taxation from capital in the private sectors of an economy are prerequisites for both rational public sector project evaluation and for the measurement of the degree of equity and distortion resulting from the economy's taxation system. Yet, in many countries, accurate knowledge of the values of these variables is absent. The principal objective of this study is to overcome this dearth of information for Canada.

## II—DETERMINATION OF SOCIAL OPPORTUNITY COST

The evaluation of any public project which retards the growth of private investment must consider the social opportunity cost of this forgone investment as a cost to the project. In the formulation suggested by Harberger<sup>1</sup> for the evaluation of public capital expenditures, the social opportunity cost of the funds (expressed as a rate) is used to discount the net benefits of the project. The discount rate is defined as a weighted average of the rates of return from investment in the private sectors which have given up funds to finance the public project, plus a weighted average of the rates of time preference for consumption in the sectors that have forgone consumption to release resources for the public project. The weight that the rate of return or time preference in a sector receives is equal to the proportion of the total funds obtained from the particular sector.

In an alternative approach to project evaluation, Feldstein<sup>2</sup> and Marglin<sup>3</sup> allow for the social opportunity cost of funds directly by deducting the consumption forgone in the transfer of funds from private to public use from the consumption benefits produced by the project. This formulation discounts the net consumption benefits produced by the project by the social rate of time preference.

In either of these two approaches, the gross rates of return from investment in the private sector of the economy must be known before the social opportunity cost of funds can be evaluated. As is shown by the results of this study, the non-neutrality of the taxation of income from capital between sectors is so significant that the use of any one rate of return from private investment will almost certainly lead to error.

For the analysis of the rates of return from capital, a distinction is drawn between the private rate of return received by the owners of the capital stock, the income generated by the capital which is collected by

governments through taxation, and the gross or social rate of return which is the total of the returns to the owner and the governments. A further breakdown of the tax payments to governments is carried out for the corporate income tax, the municipal property tax and sales taxes in order to evaluate the effective rates for each of these tax systems on the income from capital. In this paper the results of this analysis are reported annually for the period 1965 to 1969.<sup>4</sup>

## III—TRANSFORMATION OF ACCOUNTING MEASURES INTO ECONOMIC VALUES

Any methodology designed to transform accounting data into economic values, as the case of estimating the economic rates of return from capital, will be somewhat specific to the way the accounting data exists for the country in question. However, the general principles involved will be applicable to all countries, although the details of procedure may differ. The most difficult problems may not stem from the particular form of the accounting data, but from the nature of particular sectors. Agriculture, residential housing and the resource industries are examples where the nature of the activity makes it extremely difficult to obtain reliable information, even when the best techniques available are used. Therefore, a systematic solution of the problem in the case of one country will provide useful guidelines that are generally applicable.

### Sources

The primary sources of data used in this study are the taxation and financial statistics for corporations published by Statistics Canada.<sup>5</sup> These data sets are disaggregated at the 2 and 3 digit level of standard industrial classification (S.I.C.). These sources give us a detailed breakdown of the corporations' balance sheets and profit and loss statements, but represent fiscal year-end values which do not necessarily correspond with calendar year-end values.

A third source of data utilized is the estimates of fixed capital flows and stocks for manufacturing and non-manufacturing industries, constructed by the Business Finance Division of Statistics Canada for 1926 to 1969. The values for the manufacturing variables and the methodology have been published,<sup>6</sup> and permission was granted to use the unpublished data for the non-manufacturing industries in this study. These data are classified into the S.I.C. categories by establishment and include both corporate

and non-corporate organizations. Estimates for the gross and net capital stocks are arrived at by a perpetual inventory procedure using annual data for gross investment from 1870 to 1969; they are recorded in original cost, current replacement, and constant dollar prices. Within each industrial classification, separate estimates are made of the capital flows and stocks for building construction, engineering construction and machinery and equipment.<sup>7</sup>

Additional data sources have been used to estimate the current values of capital stock, revenues and expenses in the agricultural and residential housing sectors. This information will be discussed later when the sectors are analyzed.

## IV—ESTIMATION OF RATES OF RETURN AND TAXATION OF CAPITAL

The rates of return and taxation of capital in manufacturing are estimated using a breakdown of twenty major industrial divisions with a further disaggregation of five of these into twelve sub-sectors. The non-manufacturing sector is initially divided into four major industrial groups with a further breakdown of seven of these groups into twenty industries. In most cases the disaggregated industries do not constitute the complete major industrial division but are the most important sub-sectors for our purposes.

Starting with the balance sheets and profit and loss statements for the corporations as presented in the taxation and financial statistics, we find that the rules of accounting and taxation create discrepancies between the accounting data and the economic values they would ideally measure. In this study there are seven basic adjustments which we are able to apply to accounting information to give it economic significance. These adjustments are summarized below, followed by the methodology used to implement them.

- 1) The values of fixed assets are usually recorded in the accounts of corporations in original cost prices; therefore, inflation will lead to an increase in the nominal income of the firm, while no adjustment would be made to the nominal value of the capital stock. To correct this, we have to adjust the value of the capital stock from original cost dollars to current replacement dollars so that both the nominal value of income and the capital stock reflect the existence of inflation.

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Taxation laws have necessitated the use of arbitrary rules for the evaluation of depreciation expenses allowed for tax purposes each year. This value usually will not accurately measure the true economic depreciation of fixed assets. Therefore, the valuation of the fixed capital stock must be made so as to reflect the true economic depreciation that has occurred.

In the calculation of rates of return from capital in various economic activities, it is the return from fixed assets and working capital required for the operation of the industry which we are interested in (not the financial assets of non-financial industries which are held solely for their yield). Operational assets are estimated by subtracting the financial assets from the total value of assets in the industry.<sup>8</sup>

Depreciation expenses allowed for income tax purposes diverge from the true economic depreciation if either the rates allowed are incorrect or changes occur in the cost of replacing the asset. The taxation depreciation expense is based on the original cost of the asset. If the cost of replacing an asset increases, the gap between the true value of the economic depreciation of the asset and the taxation depreciation allowed also increases. In order to measure the economic return from the capital stock of an industry, its profits must be corrected to reflect the economic depreciation expense (not the depreciation expense calculated for taxation purposes).

Debt charges, taxes, and charitable donations paid by the industry, even though they represent expenses from the equity-holders' point of view, are part of the value of the product produced by the capital of the industry; therefore, they should not be deducted as an expense when calculating the income generated by the capital stock of the industry.

The financial data in the corporate profit and loss statements include income from financial assets as part of the firm's income. However, as these assets are not included as part of the capital stock of the industry, we must not

include the revenue generated by these assets as part of the income of the industry's capital stock.

- 6) In the Canadian economy, a significant part of government revenue is collected through excise taxes. Provided that material inputs enter into their respective products in fixed proportion to output, we can translate the excise tax on output as a tax on the gross value added of labour and capital. When different rates of excise tax are present in an economy, or if the depreciation rates of the capital stock are not all the same, the relative social rates of return from capital are altered by the existence of excise taxes.<sup>9</sup>
- 7) A final adjustment to the revenues of the industries is necessitated because of changes in the relative prices of their capital stocks. These changes in the relative price represent accrued capital gains or losses to the industries which are not recorded as income in the financial statistics.

A capital gain or loss which is unanticipated and not expected to be repeated has a different behavioural effect on the industry than if the capital gain or loss is expected. For most purposes of analysis, these capital gains or losses should be included in the rates of return only when they become expected. In this study the rates of return are estimated (with a few exceptions) both including and excluding the accrued capital gains and losses; however, in the applications of the rates of return, the accrued gains or losses are not included.

#### Value of Net Stock of Buildings and Equipment

In deriving net current replacement values of the capital stock (Adjustment 1), we encounter difficulty, since corporate financial and taxation data are not based on a comparable sample of firms each year. Therefore, because of mergers and divisions of corporations, it is not possible to calculate values for gross investment by comparing the gross buildings and equipment and depreciation expenses for sequential years. It is now that total industry estimates for the stocks of buildings and equipment are utilized.<sup>10</sup>

We also assume that the historical timing of gross investment in the corporate and to-

tal industry sector has been approximately the same, differing only in scale, and that the economic lives of assets are the same in the corporate and non-corporate sectors of an industry. It follows that the same relationship exists between the net stock of buildings and equipment in current replacement dollars ( $K_{ct}^n$ ) to the gross stock of buildings and equipment in original cost dollars ( $K_{ot}^g$ ) in both the corporate ( $\alpha$ ) and total industrial ( $\tau$ ) sectors for each time period ( $t$ ). The value of the gross stock of buildings and equipment for the corporate sector is given in the taxation and financial statistics for each industry, and is expressed in original cost dollars,  $\alpha K_{ot}^g$ . Using this information, along with the capital stock estimates for the total industrial sectors, we are able to calculate the values of the net stock of buildings and equipment in current replacement prices for each industry, each year, as follows:

$$1) \quad \alpha K_{ct}^{ni} = \left( \frac{\tau K_{ct}^{ni}}{\tau K_{ot}^{gi}} \right) (\alpha K_{ot}^{gi})$$

where:

$\alpha K_{ct}^{ni}$  = Net stock of buildings and equipment, corporate sector in current replacement cost dollars in the  $i$ th industry in time period  $t$ .

$\tau K_{ct}^{ni}$  = Net stock of buildings and equipment, for total sector in current replacement dollars in the  $i$ th industry in time period  $t$ .

$\tau K_{ot}^{gi}$  = Gross stock of buildings and equipment of total industrial sector in original cost dollars for the  $i$ th industry in time period  $t$ .

$\alpha K_{ot}^{gi}$  = Gross stock of buildings and equipment for the corporate sector in original cost dollars for the  $i$ th industry in time period  $t$ .

This procedure corrects the book value of the buildings and equipment in the corporate sector for changes in the nominal value of the assets due to inflation or shifts in relative prices, as well as adjusts the gross value for the economic depreciation that has taken place. In the case of land where no depreciation takes place, the book values have to be corrected only for the changes in its price.

#### Value of Working Capital

To make Adjustment 2, the financial assets



(not held as working capital) are excluded from the value of the capital stock, as is the yield from these assets from the revenue of the industry. In this study the assets that constitute the working capital of an industry include cash, accounts receivable less accounts payable, inventories and prepaid expenses. Except for inventories, these items are recorded in the corporate accounts in current dollars. In the case of inventories, the widespread use in Canada of the procedure of recording the value of inventories on a first-in, first-out basis combined only with a moderate rate of inflation, implies that their value in the corporate accounts is very close to their true current value. Therefore, no adjustment of the value of inventories has been made.

### Capital Stock of Industry

When the value of the working capital in an industry has been determined, the current value of the total capital stock in each industry is obtained by adding to the working capital the current value of the fixed assets. Included in the stock of fixed assets are the current value of land, the net current replacement value of buildings and equipment and net depletable assets. There are some kinds of investment expenditure which are generally written off in the current period, even though they may have a value beyond the period of investment. Examples of these are: exploration expenditures in the resource industries; research and development expenditures; advertising costs; and the costs borne by an industry for the specific training of its labour force.

When historical data for exploration expenditures are available, the stock of exploration capital can be evaluated and included in the net depletable assets of the resource industry. If the income from capital is also adjusted for the depletion expenses, the bias in the rate of return caused by this depletable item is eliminated. The carry-over of advertising benefits is more difficult to estimate because of the different forms such expenditures can take. When such a carry-over exists, a bias may result in the estimate of the rates of return when it is not included in the value of capital stock for the industry.<sup>11</sup>

Excluding the value of investment in human resources in the industry from its stock of capital may also cause a discrepancy between the measured and true rate of return from capital. The sign of this bias will depend on the rate at which investment in human resources in the industry is increasing.<sup>12</sup>

### Economic Depreciation Allowance

Since depreciation expenses allowed for tax purposes diverge from the value of economic depreciation, we must make a correction (Adjustment 3) in the calculation of profits. To find the value of the economic depreciation for the corporate part of an industry, we again use the information in the estimates of the fixed capital flows and stocks prepared by Statistics Canada.<sup>13</sup> From this data we can obtain values for the economic capital consumption allowance in current dollars for the total industry ( $\tau D_{ct}^e$ ). Using these values, we can calculate the economic capital consumption allowance for the corporate part of an industry in current dollars ( $\alpha D_{ct}^e$ ) as follows:

$$2) \quad \alpha D_{ct}^{ei} = \left( \tau D_{ct}^{ei} \right) \left( \frac{\alpha K_{ct}^{ni}}{\tau K_{ct}^{ni}} \right)$$

where:

$\alpha D_{ct}^{ei}$  = Economic capital consumption allowance in current dollars for corporate part of industry  $i$  in year  $t$ .

$\tau D_{ct}^{ei}$  = Economic capital consumption allowance in current dollars for total industry  $i$  in year  $t$ .

$\alpha K_{ct}^{ni}$  = Net capital stock for corporate sector in current dollars in industry  $i$  for year  $t$ .

$\tau K_{ct}^{ni}$  = Net capital stock for total industry in current dollars in industry  $i$  for year  $t$ .

The adjustment to current profits due to the correction of the depreciation expense is derived as follows:

Adjustment to profits due to cor- rection of depreciation expenses	=	Depreciation expense allowable for taxation purposes	—	Economic capital con- sumption al- lowance in current dol- lars for the corporate sector.
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### Value Added of Capital Stock

To determine the total income from capital (Adjustment 4), we start with the book value of profits adjusted to reflect the value of the economic depreciation expense. To this figure the income taxes paid, property taxes, mining and logging taxes, charitable donations, mortgage interest paid, bond interest

paid and other interest paid are added. Also included as part of income are the real gains from the sale of fixed assets. Since profits still include the income from financial assets, this total will be larger than the income we attribute to the capital stock of the industry. However, this income figure does not include the value of sales taxes paid by the value added of capital.

For the calculation of the income from capital, we must subtract the income from financial assets, which are held primarily for their yield (Adjustment 5). Financial income is defined as the sum of mortgage interest received, bond interest received, other interest received, realized capital gains on financial assets, and Canadian and foreign dividends received.

In Canada, sales and excise taxes are levied by both the federal and provincial governments. The primary sales tax of the federal government is the wholesale tax which is paid on a wide range of manufactured goods. Provincial governments traditionally have levied sales taxes at the retail level. From the Input-Output Division of Statistics Canada, we were able to obtain the value of sales for 197 industries for 1961 and the value of the federal sales tax paid on the sales of 644 commodities produced by these industries.<sup>14</sup> Using the Statistics Canada industry commodity matrix, we were able to derive the dollar value of sales tax paid on the domestic output of the industry. Since we know the value of output for the corporate part of each industry for the years 1961 to 1969, we can estimate the amount of sales tax paid on corporate output by multiplying the total sales tax by the ratio of corporate output to total output in the industry.

For years other than 1961, the ratio of sales tax to commodity output is adjusted for changes in the tax base and rates are changed. However, there have been few changes in the tax base and rates of this tax. From 1959 to 1967 the general federal sales tax rate was 11 percent; in 1967 it was raised to its present level of 12 percent.

The *Canadian National Accounts* supply the value of provincial sales tax paid by commodity and the estimated values of sales taxes on commodities for the years 1947 to 1969. In order to find the value of provincial sales tax paid on the corporate output, the commodity groups are aggregated into industrial divisions and the effective rates of sales taxes on total sales are estimated. By applying these rates to the domestically produced output of the corporate sector, we can estimate



the total value of sales taxes paid by industry. The federal and provincial sales taxes on corporate output are added together for each industry by year. These sales taxes represent a tax on both the gross value added of labour and the gross value added of capital. On the assumption that material inputs enter production in fixed proportion to output, the sales tax on output can now be translated into a tax on the gross value added of labour and capital. The value of sales tax reduced by the value added of capital is determined as follows:

$$S_K = \left( \frac{V_K^n + \alpha D_c^e}{V_L + V_K^n + \alpha D_c^e} \right) S_T$$

re:

- = The value of sales tax attributed to capital in corporate part of industry.
- = Total value of sales tax paid on output of corporate part of industry.
- = Net value added of capital.
- = Economic depreciation expense of corporate part of industry in current prices.
- = Total value added of labour.

#### Accrued Capital Gains and Losses

A measure of accrued capital gains and losses arising from changes in the value of fixed capital stock can be made by comparing movements in the price index for the capital stock of the industry with those of the gross national product deflator, as follows:

$$G_t^i = (\dot{p}_{Kt}^i - \dot{p}_{Qt}^i) (\alpha K_{ct-1}^{ni})$$

re:

- = The value of the capital gains or losses in the *i*th industry during year *t*.
- = The rate of change of the price index for the capital stock of industry *i* in year *t*.
- = The rate of change of the gross national product implicit price index in year *t*.

$\alpha K_{ct-1}^{ni}$  = The net stock of fixed capital in the corporate sector of industry *i* in year *t-1* in current replacement prices of year *t-1*.

If all price indices do not move at the same rate during the business cycle, there may be transitory gains or losses which are eliminated in another phase of the cycle, making it difficult to differentiate changes in relative prices from the adjustment of prices due to inflation. Taxes will also cause relative prices to change. The predominance of capital gains from 1963 to 1965 can be attributed to changes in federal sales tax on production machinery. In January 1963, the tax was set at 4 per cent; it rose to 8 per cent in April 1964 and to 11 per cent in January 1965. Similarly, capital losses were experienced from 1967 to 1969 with the lowering of the tax to 6 per cent in April 1967, and to zero in 1968.

Characteristics associated with certain sectors such as mining, mineral fuels, agriculture and residential housing, necessitate some modification of the above methodology in order to meet the requirements of the seven adjustments stated previously. A brief description of these modifications follows.<sup>16</sup>

#### Mining and Mineral Fuel Industries

The mining and mineral fuel industries are unique because a significant portion of the value of their capital stocks is created by exploration and development expenditures which may be written off for tax purposes during the period in which the exploration is conducted. Therefore, the taxation statistics will record a very small value for the stock of depletable assets which should equal the capitalized value of the exploration and development expenditures. Accordingly, the historical exploration and development expenditures were accumulated and depreciated to obtain the current value of depletable assets. We also found that after we adjusted the value of net depletable assets, as recorded in the financial statements of the corporations, these two estimates of net depletable assets at current prices were quite close. The latter estimates for the depletable assets of mining and mineral fuels were used.

The mineral fuels industry is mainly located in Alberta and is almost entirely concerned with the development and extraction of natural gas and crude oil. The Alberta Government has obtained revenue from the oil companies through a system of production royalties and mineral right sales. These

provincial revenues are generally deducted from taxable income for federal income tax purposes and, therefore, involve a transfer of income tax revenue from the federal government to the provincial government.

Difficulty arises when we try to divide these provincial revenues between payments made by the mineral fuels and petroleum refining industries as most companies engage in both activities. Also, the data for the revenues from the royalties and mineral rights are not classified by industry. Therefore, after analyzing each industry separately before including the provincial revenues, we aggregate the capital stock and income data for refineries and mineral fuels and construct the private and social rates of return for the combined sector.

#### Agriculture

The contribution of agriculture to the national economy declined in relative size during the period 1953-1970, even though government continued to provide extensive assistance. At present, agriculture is completely dominated by the non-corporate form of organization, with only two per cent of assets owned by corporations. In this study we treat the entire agricultural sector as being non-corporate.

Most of the information required for estimating the rates of return in agriculture have been collected in their current values by various statistical agencies in Canada. Current revenue, including income-in-kind and operating expenses, is available annually for the period 1953 to 1970. Income-in-kind includes the food, construction materials and imputed house rental that agriculture provides for farmers.<sup>17</sup> The values of the capital stock, which includes land, buildings, livestock, poultry, implements and machinery, are estimated by a semi-annual survey and are supplemented by the Census of Agriculture which is conducted every five years. All the capital stock data which are published are evaluated at current net replacement cost.<sup>18</sup>

Two serious deficiencies in the available information have to be corrected before the rates of return can be estimated. Estimates do not exist for either the total amount of direct subsidies to agriculture or the social opportunity cost of non-wage labour employed in agriculture. The latter creates a problem because, after all operating and paid-labour costs are deducted from the value of gross sales, the residual net income is partially produced by the capital of the owners, along with the labour of the owners



and non-wage family workers.

To overcome this difficulty, upper and lower limits are estimated for the imputed income of non-wage labour in agriculture. As the number of man years of paid labour per year and total annual wages are known, the annual income per paid labourer can be determined. To obtain the upper limit on the size of the imputed income to the non-wage labourers, it is assumed that they earn an annual income equivalent to that of the paid workers. As unpaid family workers (including part-time help from family members) constitute approximately 30 per cent of the total non-wage labour force, this estimate represents an over-estimate of the value of non-wage labour in agriculture. The low estimate for the value of non-wage labour in agriculture is constructed by imputing the paid workers' wages to the employers and owners of farms but a zero wage to the unpaid family workers. As the supply price of unpaid family labour is almost certainly greater than zero, this estimate of the value of non-wage labour should represent a lower limit for the value of this variable.

Support programs for agriculture have a long history of popularity in Canada. In all, there are currently nine different Acts of Parliament providing assistance to agriculture. Each of these is examined for the years 1965 to 1969 to determine the form of subsidy and to evaluate its direct financial benefit to the sector for each year.<sup>19</sup> From the total subsidy paid to agriculture each year, we can estimate both the private and social rates of return from capital for the years 1965 to 1969.

#### **Residential Housing**

To evaluate the private and social rates of return from owner-occupied and rental housing, we use the estimates of gross imputed and gross paid rents made by the National Accounts Division of Statistics Canada. We are able to obtain from this source an unpublished breakdown of the housing expenses (property taxes, repairs and maintenance, insurance) with which we can calculate the net income accruing to the stock of residential housing. The current values of the stock of non-farm houses, along with their annual depreciation expense, are obtained from estimates made by Statistics Canada.<sup>20</sup>

It is necessary to obtain a separate series on the current value of the stock of owner-occupied and rental housing because of differential tax treatment. The current value of the total non-farm housing stock is multiplied by the ratio of gross imputed rents from

owner-occupied housing to the total rents (imputed plus paid) from residential housing. This provides us with an estimate of the current value of the owner-occupied housing stock.

Personal income tax in Canada does not cover the income accruing from the equity portion of owner-occupied dwellings. Because this income is exempt, there is an implicit subsidy given to the purchase of housing services through the ownership of a dwelling. This subsidy is equal to the owner's marginal personal income tax rate times the amount of equity he has in his house, times the rate of return. In this study we make the assumption that the 'typical' taxpayer is in the 25 per cent marginal tax bracket, and that the owner's equity is equal to 50 per cent of the value of the non-rental housing stock. With these assumptions we obtain the rate of the subsidy as a percentage of the value of the owner-occupied housing stock.

Because of the way the total stock of non-farm housing is divided into rental and owner-occupied stocks, we are assuming that the private rates of return in the two categories are equal. In fact, the gross or social rate of return from the rental housing stock is larger than the gross return from the owner-occupied stock by the amount of the implicit subsidy created by exempting the services of owner-occupied housing from taxable income.

The final point in the methodology is concerned with the extension of the analysis to the non-corporate part of industry sectors. After taking care of agriculture and residential housing, we find that very few other sectors are made up of a significant proportion of non-corporate firms, except those in the trade and service sectors.

#### **Non-Corporate Industrial Sector**

Although no revenue or tax data exist for the non-corporate industrial sectors, the size of their capital stocks and their rates of return can be estimated from the corporate financial data and the existing estimates of the total capital stock for each industrial sector. The proportion of an industrial sector that is non-corporate can be determined by comparing the values of the gross capital stock at original cost dollars for the total industrial sector, as estimated by Statistics Canada, with this same variable for the corporate part of the sector as found in the financial statistics for the corporations. The value of the net capital stock of the total sector is then adjusted to include the working capital in the

sector, based on the assumption that the ratio of working capital to total fixed assets is the same in the corporate and non-corporate segments of an industry.

After estimating the size of the non-corporate capital stock, we are left with the problem of determining the correct rate of return to attribute to this part of the capital stock of each industry. Christensen, in his analysis of the rates of return from capital for the United States, found that the private rate of return in the non-corporate part of an industry has been approximately equal to the private rate of return in the corporate part. Therefore, the social rate of return from the non-corporate part of an industry will equal the social rate of return in the corporate sector minus the rate of corporate income tax paid on all assets. The private rate of return in the non-corporate sector is easily determined by deducting the remaining taxes paid from the non-corporate social rate of return.

#### **V—ESTIMATES OF RATES OF RETURN AND TAXATION**

By applying the methodology developed in the above section, we make adjustments to the accounting data. The resulting information which is used to estimate the rate of return and taxation, is presented in Table A through F of the appendix. Table A contains the values for the working capital and fixed assets of the sectors for the years 1965 to 1969. The values for the capital stocks at net current replacement cost prices which reflect the transformations made to the data are adjustments 1 and 2.

The incomes generated by the capital stocks which accrue to the private sector are presented in Table B. These values require adjustments 3, 4, and 5, except that we exclude taxes paid. Private income from the stock of capital includes both the interest paid on debt and any subsidies received by the industry.

Accrued capital gains and losses by sector are estimated following the procedure in Equation 4 (Adjustment 7) and are shown in Table C. These values are also expressed in current prices for the year in which they accrue. Tables D to F, respectively, contain values of property taxes, income taxes, and sales taxes, paid by the income from capital.

From this information the private and gross or social income, as well as the various taxes, can be expressed as percentages of the stock of capital in a sector to derive rates of return and taxation. Some of the more



stant of these rates are presented in Table 1. The private rates of return, excluding and including capital gains and losses, are shown in columns 1 and 2 respectively. Excluding capital gains and losses, we find the private rates of return in the manufacturing sector averaged 6.5 per cent over the five year period 1965 to 1969. This is to be compared with a private rate of return in the non-manufacturing sector of 6.3 per cent and the weighted average of all activities of 5.8 per cent. The rather small range of values for the private rates of return contrasts with the values of the social rates of return that include taxes (column 7), where the rate of manufacturing is 15.1 per cent for non-manufacturing 9.4 per cent and the average of all activities 9.4 per cent.

For an estimation of the social opportunity cost of public funds or the social cost of private investment, it is the value of the taxes and subsidies (columns 3 to 5) and the resulting social rates of return (column 7) that are of primary interest.

For most governments, the capital market is the marginal source of revenue for financing investment projects, while in periods of budgetary surplus, funds are made available to the capital market either by slowing

down the rate of government borrowing or by diminishing the public debt. In this context it is appropriate to evaluate the social opportunity cost of public funds as the social value of these resources, if they were used in the private sectors of the economy. When governments borrow, they bid financing away from the private sectors in different proportions depending on the demand elasticities with respect to the cost of borrowing in the individual investment and consumption sectors.

Following the method proposed by Harberger<sup>22</sup> for evaluating the social opportunity cost of a given amount of government borrowing, we weight the social return from investment and the social rate of time preference for consumption in each of the non-government sectors by the proportion of the funds that was bid away from that sector. For funds bid away from investment in the private sectors, the appropriate social returns to be weighted are those presented in column 7 of Table 1. For Canada the supply of resources can also be increased by foreign borrowing; the social cost of these funds is measured as the real rate of interest paid on securities sold abroad.

An accurate measure of the weights for

each of the rates of return or time preferences in the private sectors would require information on the reaction of each of the private sectors to an increase in government borrowing. Using a somewhat less precise weighting scheme, the author in a previous study<sup>23</sup> estimated the social opportunity cost of government borrowing to be approximately 9.5 per cent for Canada during the period 1965 to 1969. The weighting scheme used to give this estimate implied that of any increase in government borrowing 10 per cent was financed by capital inflows from foreign countries, 16 per cent was financed by a reduction of residential housing construction, 10 per cent came at the cost of domestic consumption, and the remaining 64 per cent was financed by a reduction of investment in the industrial sectors.

This has been one example of the many applications that can be conducted with the information provided by this study. As previously mentioned, any evaluation of the equity and efficiency of the taxation of the income from capital in Canada will require this information as will any method of project evaluation which takes into consideration the social opportunity cost of funds.

C. Harberger, "On Measuring the Social Opportunity Cost of Public Funds", The Discount Rate in Public Investment Evaluation: Conference Proceedings of the Committee on the Economics of Water Resources Development (Denver: Western Agricultural Economics Research Council, 1968).

S. Feldstein, "Net Social Benefit Calculation and the Public Investment Decision", Oxford Economic Papers, XVI (March, 1964). Also, M.S. Feldstein, "Choice of Technique in the Public Sector: A Simplification", Economic Journal, XX (December, 1970).

A. Marglin, "The Opportunity Costs of Public Investment", Quarterly Journal of Economics, LXXVII (May, 1963).

Although the values for many of the variables can be derived for a much longer period of time, it is only from 1965 to 1969 that complete information is available. The results, complete and incomplete, for the period 1953 to 1969 are presented in Glenn P. Jenkins's Analysis of Rates of Return from Capital in Canada (unpublished Ph.D. dissertation, University of Chicago, 1972). Dr. Jenkins's Ph.D. dissertation is partially supported by the Canada Council.

Statistics Canada, Corporation and Labour Unions Return Division, Corporation Financial Statistics, 1965-1969, Catalogue No. 61-207 and Corporation Taxation Statistics, 1965-1969, Catalogue No. 61-208. Statistics Canada, Business Finance Division, Fixed Capital Flows and Stocks, Manufacturing Canada 1965-1969, Catalogue 13-523.

In general, price indices have been constructed for the different categories of assets for each industry and estimates made of their length of economic life. So price indices for industrial, agricultural and residential land were constructed. For a more complete discussion of the methodology used to con-

struct price indices and length of life estimates see: Jenkins, pp. 6-16; T.K. Rymes, Fixed Capital Flow and Stocks Methodology (Statistics Canada, 1967); C.M. Jones, "Price Indexes for Non-Residential and Engineering Construction", Canadian Statistical Review, XLV, No. 1 (Statistics Canada, Jan. 1970); P.S.K. Murty, "Revised Price Indexes of Construction Expenditures for G.N.E. Deflation", Canadian Statistical Review, XLV, No. 11 (Statistics Canada, Nov. 1970).

<sup>8</sup> In the case of financial intermediaries where the portfolio of financial assets is necessary to carry out their economic function, this adjustment does not apply. In this study the rates of return for this industry are estimated using two different assumptions about the composition of the capital stock: (a) capital defined inclusive of financial assets and (b) capital defined as the economic value of the equity.

<sup>9</sup> Arnold C. Harberger, "The Measurement of Waste", American Economic Review, LIV (May, 1964), 58-76.

<sup>10</sup> Buildings and equipment in the capital stock estimates prepared by Statistics Canada, Business Finance Division, refer to building construction, engineering construction and machinery.

<sup>11</sup> The direction of bias was evaluated theoretically and some empirical testing was conducted by T.R. Stauffer in Measurement of Corporate Rates of Return (unpublished Ph.D. dissertation, Harvard University, 1971).

<sup>12</sup> When the investment in specific training is not capitalized, the measured capital stock of the industry is smaller than its true economic value. This tends to bias the measured rate of return upward. However, the net income of the firm also decreases as the investment in this training each year is treated as a

current expense and not depreciated through time. For the calculation of rate of return, these two errors in measurement tend to offset each other.

<sup>13</sup> For a more complete description of the derivation of the economic life assumptions see Rymes, pp. 87-103.

<sup>14</sup> The Input-Output Division of Statistics Canada has constructed the federal sales tax margins by commodity from 1961 to 1967. However, except for 1961, they have been reluctant to release this information.

<sup>15</sup> These data were released to us by the National Accounts Division, Statistics Canada for use in this study. This information is not published.

<sup>16</sup> For the more complete explanation of the methodology as related to mining, mineral fuels, agriculture and residential housing, see Jenkins, pp. 47-67, also appendices, A, C and D.

<sup>17</sup> Statistics Canada, Farm Finance Section, Farm Net Income, Catalogue No. 21-202.

<sup>18</sup> Statistics Canada, Agriculture Division, Quarterly Bulletin of Agricultural Statistics, Catalogue No. 21-003.

<sup>19</sup> For the agriculture labour force data, estimation of non-wage labour income, and the estimation of the value of subsidies given to agriculture, see Jenkins, Appendix D.

<sup>20</sup> Statistics Canada, Housing and Building Permits Section, Canadian Housing Capital Stock (unpublished).

<sup>21</sup> L. R. Christensen, "Entrepreneurial Income: How Does It Measure Up", American Economic Review, LXI, No. 4 (September, 1971).

<sup>22</sup> A. C. Harberger, "On Measuring the Social Opportunity Cost of Public Funds".

<sup>23</sup> Jenkins, p. 99.

**TABLE 1**  
**RATES OF RETURN AND TAXATION FROM CAPITAL IN CANADA BY SECTOR**  
Average 1965-1969

Industry		1 d Private Rate of Return Excluding Capital Gains and Losses	2 e Private Rate of Return Including Capital Gains and Losses	3 f Property tax as a percentage of Net Fixed Assets and Working Capital	4 g Income tax as a percentage of Net Fixed Assets and Working Capital	5 h Sales taxes as a percentage of Net Fixed Assets and Working Capital	6 i Gross Rate of Return Excluding Capital Gains and Losses and Sales Taxes	7 j Social Ra of Return Excluding Capital G and Losses cluding Sales
1.	Foods and Beverages	7.99	7.21	.79	5.10	15.78	13.88	29.66
	A. Food Industries	6.67	5.87	.77	3.49	.41	10.94	11.34
	B. Soft Drinks	10.82	9.91	.91	5.82	5.66	17.25	23.30
	C. Breweries and Wineries	11.57	10.88	.68	10.28	74.16	22.52	96.68
2.	Tobacco Products	6.96	6.66	.37	6.41	119.27	13.73	133.00
3.	Rubber Products	5.15	4.48	.41	3.31	2.54	8.86	11.41
4.	Leather Products	5.19	4.91	1.06	2.69	3.54	8.94	12.48
5.	Textile Mills	4.81	3.65	.51	2.31	1.40	7.62	9.01
6.	Knitting Mills	6.21	4.67	.84	3.09	5.62	10.14	15.76
7.	Clothing Industry	6.57	6.05	.88	2.99	4.47	18.44	14.92
8.	Wood Industry	6.98	5.79	.51	2.90	.14	10.39	10.53
9.	Furniture	6.62	5.95	1.26	2.75	4.61	10.63	15.23
10.	Pulp and Paper and Allied Ind.	4.65	3.63	.56	2.22	.21	7.44	7.65
	A. Pulp and Paper Mills	4.56	3.17	.52	1.98	.11	7.07	7.17
	B. Paper Boxes and Convertors	6.73	5.69	1.07	5.26	1.29	13.06	14.34
11.	Printing and Publishing	9.49	8.76	.73	5.42	1.02	15.64	16.66
	A. Commercial Printing	8.28	7.57	.78	3.39	1.86	12.45	14.31
	B. Publishing	2.36	1.32	.11	1.54	.21	4.00	4.21
12.	Primary Metals	6.02	4.92	.23	2.29	.27	8.53	8.79
13.	Metal Fabricating	6.51	6.10	.67	3.77	.66	10.96	11.62
14.	Machinery Industries	9.10	8.77	.45	4.61	1.58	14.17	15.75
15.	Transportation Equip.	7.73	7.25	.59	5.39	9.34	13.71	23.04
	A. Aircraft and Parts	4.22	3.89	.40	.66	.92	5.29	6.20
	B. Motor Vehicles	11.45	10.59	.70	8.38	15.54	20.54	37.08
	C. Miscellaneous Transportation	4.05	3.63	.65	3.80	1.14	8.50	9.65
16.	Electrical Industries	6.37	5.82	.46	3.07	4.30	9.90	14.20
	A. Electrical Industrial Equip.	5.54	4.98	.73	2.77	1.27	9.04	10.32
	B. Other Electrical Products	7.03	6.43	.31	3.93	6.13	10.68	16.81
17.	Non-Metallic Mineral Products	6.09	5.05	.46	2.39	.50	8.95	9.44
18.	Petroleum and Coal Refineries	5.84	4.91	1.33	1.35	4.71	8.51	13.22
19.	Chemical Industries	6.33	5.39	.45	4.26	.91	11.03	11.94
20.	Miscellaneous Manufacturing	6.47	5.93	.72	5.10	3.32	12.29	15.61
21.	Total Manufacturing	6.45	5.53	.61	3.32	4.77	10.38	15.14
22.	Total Construction	6.54	6.24	.68	2.61		9.82	9.82
	A. Building Contractors	4.92	4.79	.81	2.12		7.84	7.84
	B. Bridge and Highway Construction	6.33	5.98	.41	2.76		9.50	9.50
23.	Total Transportation	2.62	.59	.82	1.06		4.50	4.50
	A. Air Transport	3.49	1.81	.36	.35		4.20	4.20
	B. Water Transport	1.78	-.28	.27	.58		2.64	2.64
	C. Railways	1.03	-1.00	.67	.90		2.60	2.60
	D. Truck Transport	9.08	7.67	3.24	2.71		15.03	15.03
	E. Pipelines	6.56	4.28	.64	1.92		9.12	9.12
24.	Storage	4.00	4.14	1.33	1.18		6.50	6.50
	A. Grain Elevators	3.27	3.41	.62	1.01		4.89	4.89
	B. Storage and Warehouse	6.05	5.96	3.61	1.96		11.62	11.62
25.	Communications	6.94	5.26	.84	2.63	.48	10.40	10.88
	A. Radio and Television	5.71	4.56	.50	3.95		10.16	10.16
	B. Telephones	7.00	5.29	.97	2.53	.53	10.41	10.94
26.	Public Utilities	5.57	1.41	.91	1.78	.61	8.27	8.87
	A. Electrical Power	4.97	.69	.81	2.00	.66	7.78	8.44
	B. Gas Distribution	6.32	2.21	1.00	1.57	.58	8.89	9.47
27.	Wholesale Trade	7.72	7.57	.75	3.61	.54	12.09	12.63
28.	Retail Trade	7.59	7.33	1.62	3.53	.57	12.73	13.30
29.	Total Finance, Insurance, and Real Estate	4.22	4.21	.23	.39		4.84	4.84
	A. Trust Companies	4.81	4.81	.04	.34		5.19	5.19
	B. Mortgage and Loan Companies	5.16	5.17	.01	.20		5.27	5.27
	C. Banking	3.30	3.29	.02	.41		3.73	3.73
	D. Total Deposit Accepting Institutions	3.27	3.28	.02	.36		3.65	3.65
	E. Total Investment Companies	4.89	5.26	.04	.25		5.17	5.17
a*29.	Total Finance, Insurance, and Real Estate	6.74	6.73	.90	1.52		9.16	9.16
	*A. Trust Companies	6.64	6.67	.48	4.05		11.16	11.16
	*B. Mortgage and Loan Companies	10.07	10.17	.17	2.17		12.41	12.41
	*C. Banking	8.57	8.31	.38	9.02		17.96	17.96
	*D. Total Deposit Accepting Institutions	7.51	7.55	.29	6.20		14.00	14.00
	*E. Total Investment Companies	6.10	6.10	.06	.33		6.48	6.48
30.	Total Services	9.88	9.83	1.46	2.24	.17	13.58	13.75
	A. Services to Business and Management	17.42	17.07	1.05	7.34		25.82	25.82
	B. Personal, etc., Services	9.43	9.53	1.46	1.65	.19	12.54	12.73
b 31.	Total Non-Manufacturing	6.25	5.31	.95	2.01	.13	9.21	9.39
32.	Mining	7.36	n.a.	.38	2.42		10.16	10.16
33.	Mineral fuels	4.94	n.a.	.42	.80		6.18	6.18
	A. Mineral fuels and Petroleum Refineries	5.34	n.a.	5.05	1.06	2.27	11.45	13.71
34.	Agriculture	2.66	5.20	.80	-.63		2.83	2.83
** 34.	Agriculture	4.31	6.85	.80	-.63		4.48	4.48
35.	Rental Housing	5.33	7.84	2.48	nil		7.86	7.86
36.	Owner Occupied Housing	5.38	7.84	2.48	-.67		7.19	7.19
37.	Trade (non-corporate)	7.34	7.19	1.13	nil	.56	8.47	9.03
c 38.	Total All Activities	5.82	n.a.	1.49	1.13	1.00	8.44	9.44

a. The rates of return and taxation in categories \*29 and \*29A through \*29B for financial intermediaries are based on the value of equity in the sector and the private rates of return only include income accruing to the equity holders.

b. The rates for non-manufacturing exclude 29 but include \*29 for financial intermediaries.

c. The rates of return for the total of all activities excludes categories

d.  $(\text{Table B} + \text{Table A}) \times 100$  and averaged over the five years 1965-1969.

e.  $\{(\text{Table B} + \text{Table C}) + (\text{Table A})\} \times 100$  and averaged over the five years 1965-1969.

f.  $(\text{Table D} + \text{Table A}) \times 100$  and averaged over the five years 1965-1969.

g.  $(\text{Table E} + \text{Table A}) \times 100$  and averaged over the five years 1965-1969.

h.  $(\text{Table F} + \text{Table A}) \times 100$  and averaged over the five years 1965-1969.

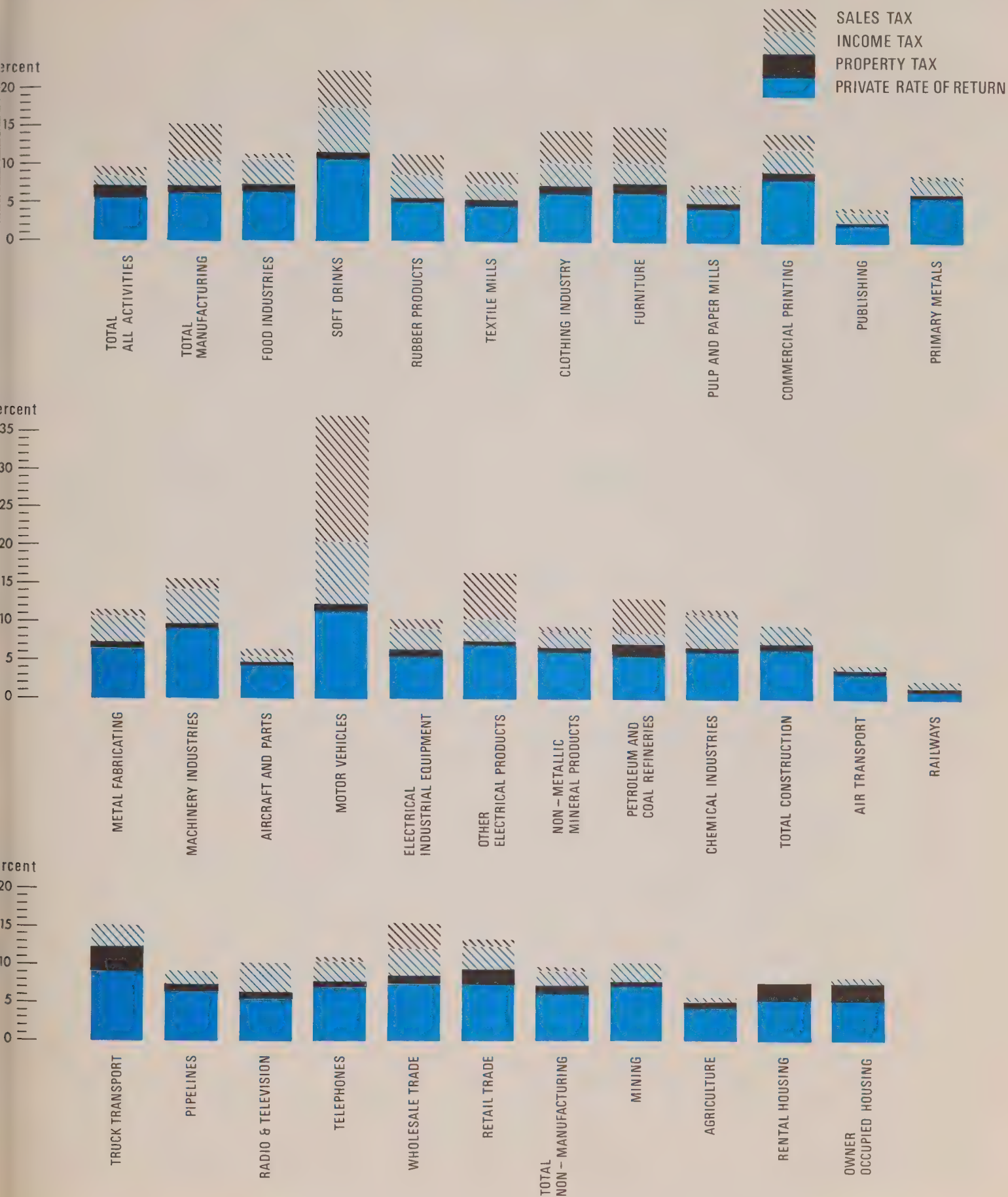
i.  $\{(\text{Table B} + \text{Table D} + \text{Table E}) + (\text{Table A})\} \times 100$  and averaged over the five years 1965-1969.

j.  $\{(\text{Table B} + \text{Table D} + \text{Table E} + \text{Table F}) + (\text{Table A})\} \times 100$  and averaged over the five years 1965-1969.

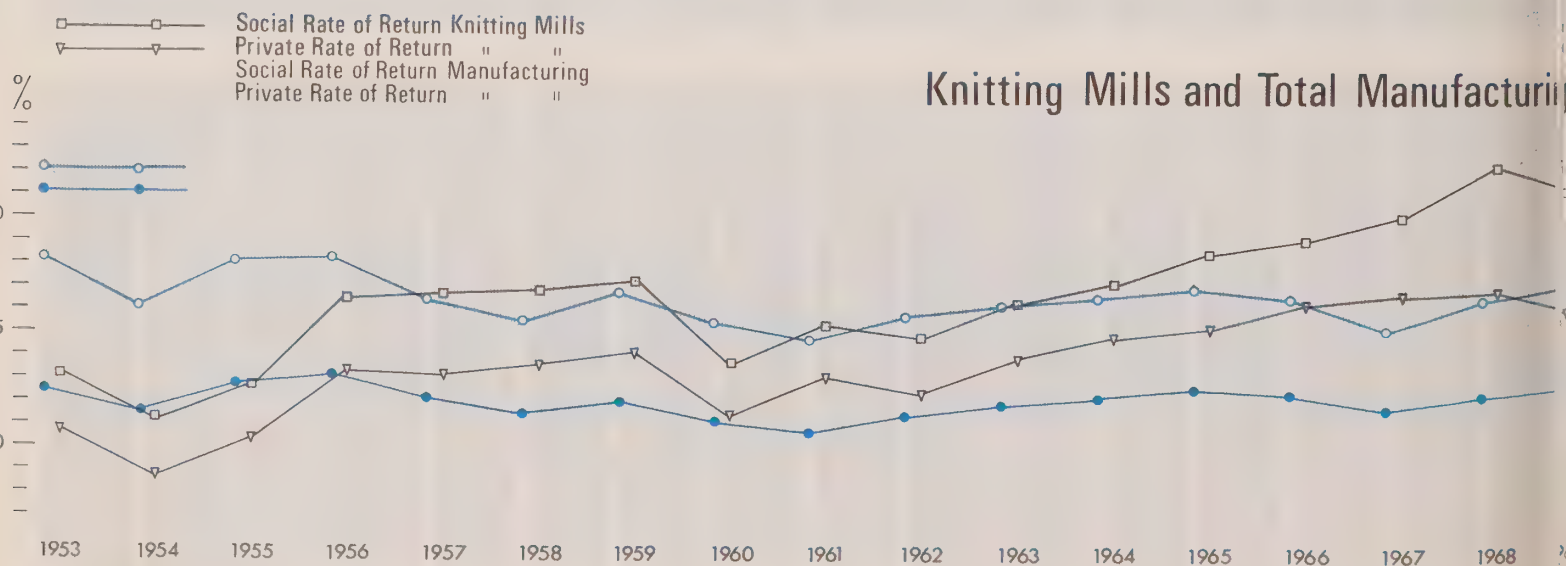
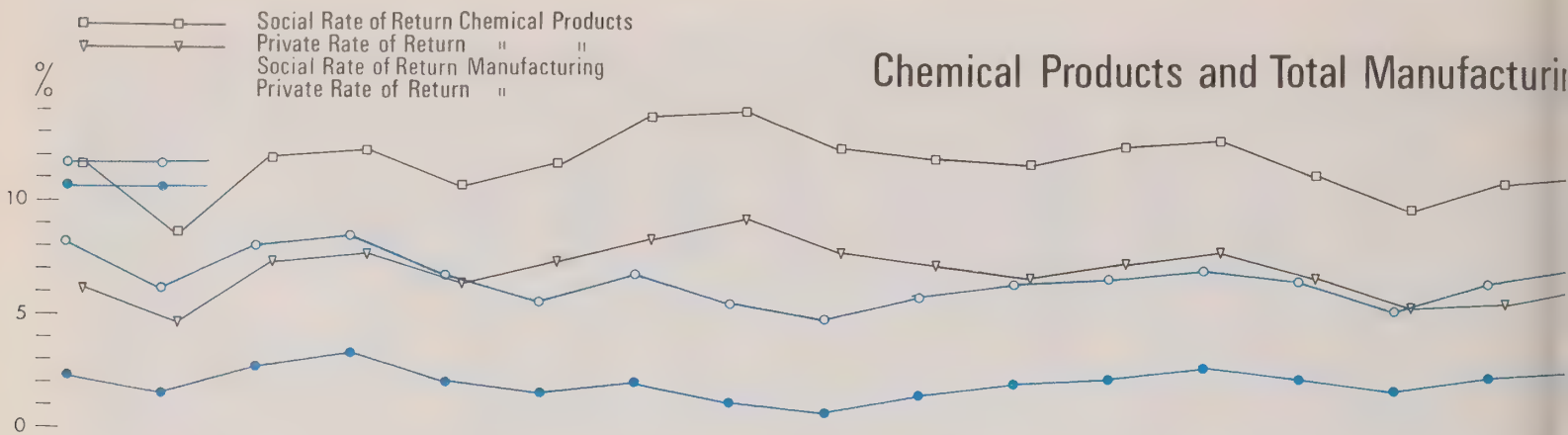


# RATES OF RETURN AND EFFECTIVE TAXATION OF PRIVATE CAPITAL IN CANADA

11



## COMPARISON OF RATES OF RETURN





# SELECTED INDUSTRIES, 1953 - 1969

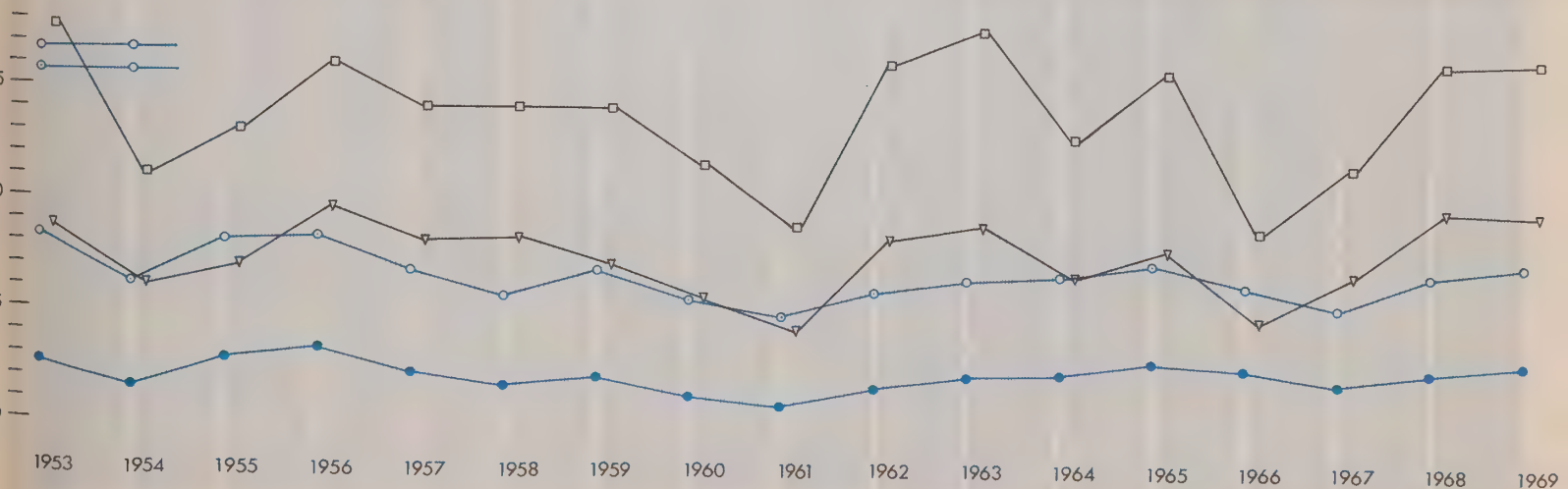
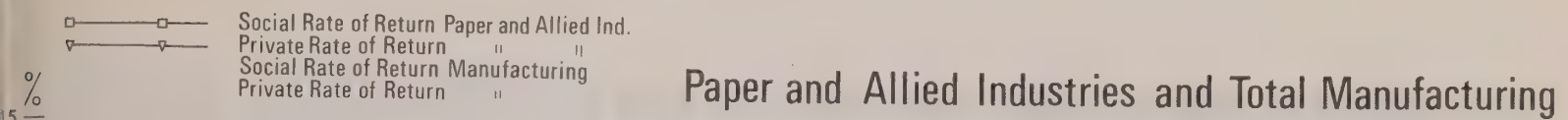


TABLE A  
NET FIXED ASSETS AND WORKING CAPITAL  
Current Cost Prices  
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	3367.0	3592.4	3758.1	3768.8	4051.5
	A. Food Industries	2610.7	2699.6	2839.2	2806.4	3058.2
	B. Soft Drinks	182.3	190.6	212.2	211.6	230.4
	C. Breweries and Wineries	660.6	761.8	733.8	764.2	883.3
2.	Tobacco Products	295.3	309.9	368.2	369.3	360.5
3.	Rubber Products	430.9	520.0	547.8	590.6	637.3
4.	Leather Products	147.0	178.8	172.6	187.0	223.0
5.	Textile Mills	1227.8	1392.0	1453.2	1498.4	1518.3
6.	Knitting Mills	170.2	167.7	175.0	165.3	197.6
7.	Clothing Industry	360.7	453.2	383.5	395.0	414.9
8.	Wood Industry	1208.2	1316.4	1367.0	1287.1	1436.6
9.	Furniture	182.3	240.7	278.0	302.1	339.1
10.	Pulp and Paper and Allied Ind.	4498.7	4772.1	5224.0	5398.0	5634.5
	A. Pulp and Paper Mills	4117.2	4186.4	4552.5	4679.6	5157.5
	B. Paper Boxes and Convertors	381.3	421.3	467.3	483.8	477.2
11.	Printing and Publishing	739.0	873.6	859.8	840.1	923.7
	A. Commercial Printing	364.5	439.5	433.9	412.2	508.4
	B. Publishing	299.9	343.1	327.5	322.8	238.0
12.	Primary Metals	4915.2	5214.0	5211.3	5205.9	4385.7
13.	Metal Fabricating	1676.0	1961.5	2108.7	2047.7	2267.8
14.	Machinery Industries	1223.0	1531.0	1580.5	1591.7	1866.1
15.	Transportation Equipment	1827.4	2496.8	2635.2	2668.6	3043.6
	A. Aircraft and Parts	355.9	510.8	573.0	531.7	597.9
	B. Motor Vehicles	1092.1	1224.4	1290.0	1298.7	1996.4
	C. Miscellaneous Transportation	379.1	453.8	415.6	461.9	449.2
16.	Electrical Industries	1349.2	1654.3	1756.1	1861.0	2019.6
	A. Electrical Industrial Equip.	498.5	556.0	624.5	634.2	692.5
	B. Other Electrical Products	850.6	1072.9	1063.8	1139.0	1327.3
17.	Non-Metallic Mineral Products	1216.0	1420.7	1470.6	1451.3	1546.4
18.	Petroleum and Coal Refineries	2858.5	3547.1	2540.2	2772.2	3252.6
19.	Chemical Industries	1973.7	2285.2	2421.0	2530.6	2560.6
20.	Miscellaneous Manufacturing	603.7	689.7	687.9	747.7	860.8
21.	Total Manufacturing	30270.7	34618.1	34999.6	35679.3	37541.1
22.	Total Construction	2499.6	2967.6	3163.0	3378.1	3903.4
	A. Building Contractors	1169.2	1332.0	1390.6	1475.8	1840.9
	B. Highway and Bridge Construction	465.6	478.5	509.7	518.0	579.9
23.	Total Transportation	9732.6	10506.5	11104.9	11992.9	12885.6
	A. Air Transport	313.9	358.1	464.5	628.4	844.2
	B. Water Transport	n.a.	1140.0	1190.5	1316.8	1366.8
	C. Railways	n.a.	6198.7	6438.8	6752.2	7167.2
	D. Truck Transport	479.2	578.3	569.2	621.1	707.7
	E. Pipelines	1725.1	1857.1	2039.3	2218.8	2486.3
24.	Storage	437.5	412.9	424.5	497.4	457.5
	A. Grain Elevators	301.9	298.4	314.5	389.9	349.7
	B. Storage and Warehouses	124.9	105.3	100.6	101.1	101.7
25.	Communications	3348.2	3821.6	4127.6	4428.5	4966.4
	A. Radio and Television	277.7	282.6	306.9	345.8	400.9
	B. Telephones	3054.4	3496.7	3767.8	4031.3	4593.1
26.	Public Utilities	1828.6	2021.7	2227.0	2354.3	2548.1
	A. Electrical Power	920.4	1028.8	1044.5	1062.3	1192.3
	B. Gas Distribution	873.8	1067.9	1133.8	1203.3	1313.1
27.	Wholesale Trade	4812.9	5483.2	6237.5	6777.2	7177.5
28.	Retail Trade	3675.6	4304.3	4623.7	4909.6	5513.9
29.	Total Finance, Insurance, and Real Estate	72369.8	72048.8	79977.0	90353.6	103454.0
	A. Trust Companies	3532.5	3911.7	4318.4	4934.9	5744.8
	B. Mortgage and Loan Companies	5214.5	5854.4	7530.8	8323.9	9524.5
	C. Banking	n.a.	27578.2	30442.8	35027.7	40618.4
	D. Total Deposit Accepting Institutions	34001.3	37344.5	42291.9	48285.6	55888.2
	E. Total Investment Companies	14441.7	16926.8	18532.2	21023.9	23854.5
a*29.	Total Finance, Insurance, and Real Estate	18167.7	19005.1	2115.8	23431.2	26270.7
	*A. Trust Companies	295.5	346.1	359.5	409.5	435.2
	*B. Mortgage and Loan Companies	503.1	548.5	640.4	698.4	834.6
	*C. Banking	n.a.	1347.6	1476.6	1488.2	1748.2
	*D. Total Deposit Accepting Institutions	2114.3	2242.3	2476.6	2595.3	3017.9
	*E. Total Investment Companies	10939.3	12584.3	13899.6	15853.1	17230.7
30.	Total Services	2719.8	3590.0	3741.5	4092.8	4862.3
	A. Services to Business and Management	225.3	359.2	386.9	408.5	483.0
	B. Personal, etc., Services	2573.6	3333.1	3447.7	3791.4	4501.7
31.	Total Non-Manufacturing	47223.0	52113.2	56765.8	61862.3	68585.7
32.	Mining	3542.7	3777.7	4185.9	4385.0	5713.0
33.	Mineral fuels	3023.1	3270.1	3921.5	4519.4	5072.5
	A. Mineral fuels and Petroleum Refineries	5881.7	6817.2	6461.8	7291.6	8325.1
34.	Agriculture	17217.8	19062.6	20952.6	22452.3	23356.2
35.	Rental Housing	15054.5	16930.6	18276.1	19876.4	22612.5
36.	Owner Occupied Housing	32737.7	36143.5	38658.8	41451.7	46328.0
37.	Trade (Non-Corporate)	2716.3	3132.0	3475.6	3739.8	4061.2
38.	Total All Activities	151786.0	169048.0	181236.1	193966.4	213270.4

a The values for the capital stock of financial intermediaries in the total for category 29 and the sub-categories 29A to 29E include all the fixed plus financial assets, while in the categories \*29 and \*29A through \*29E the capital stock is taken to be the value of the equity of the corporation adjusted to reflect the current replacement values of the assets.



TABLE B  
NET PRIVATE INCOME (EXCLUDING CAPITAL GAINS)  
(millions of dollars)

Industry	1965	1966	1967	1968	1969
1. Foods and Beverages	269.1	282.2	268.5	301.5	363.4
A. Food Industries	180.2	187.3	162.0	175.5	230.0
B. Soft Drinks	19.5	20.6	27.0	22.3	21.5
C. Breweries and Wineries	69.5	74.6	81.9	105.1	111.2
2. Tobacco Products	19.3	23.3	26.5	23.9	25.5
3. Rubber Products	17.9	26.6	32.7	29.1	35.6
4. Leather Products	4.8	11.0	9.6	11.4	10.9
5. Textile Mills	63.2	76.7	56.8	66.8	82.3
6. Knitting Mills	9.0	10.4	11.8	11.3	11.8
7. Clothing Industry	19.6	23.9	27.4	28.3	32.6
8. Wood Industry	84.1	60.3	62.7	106.2	150.8
9. Furniture	11.1	19.8	16.8	24.6	15.6
10. Pulp and Paper and Allied Ind.	269.2	271.1	175.5	161.8	294.1
A. Pulp and Paper Mills	242.7	242.5	147.9	137.8	261.8
B. Paper Boxes and Convertors	26.3	28.5	27.6	31.3	36.4
11. Printing and Publishing	69.2	80.3	80.4	80.9	91.6
A. Commercial Printing	25.9	41.0	41.1	33.7	37.3
B. Publishing	7.7	5.3	7.1	7.0	10.0
12. Primary Metals	373.3	378.4	294.2	334.2	138.7
13. Metal Fabricating	106.6	135.1	125.5	130.9	158.2
14. Machinery Industries	102.3	143.3	149.9	138.8	178.6
15. Transportation Equipment	143.3	115.5	181.1	259.1	292.7
A. Aircraft and Parts	10.3	15.5	32.7	38.5	17.1
B. Motor Vehicles	114.7	82.8	139.8	202.6	270.9
C. Miscellaneous Transportation	18.6	17.2	8.6	18.0	25.1
16. Electrical Industries	86.9	114.7	105.8	103.7	139.3
A. Electrical Industrial Equip.	27.1	36.7	31.1	25.7	45.9
B. Other Electrical Products	59.7	78.1	74.5	77.8	93.3
17. Non-Metallic Mineral Products	85.2	94.8	80.0	70.6	100.1
18. Petroleum and Coal Refineries	151.1	207.0	143.3	182.1	190.2
19. Chemical Industries	157.3	149.8	127.1	140.7	161.2
20. Miscellaneous Manufacturing	18.6	37.3	53.8	58.4	70.8
21. Total Manufacturing	2061.3	2261.5	2029.4	2264.3	2544.0
22. Total Construction	129.6	226.6	234.4	219.9	232.1
A. Building Contractors	49.5	64.5	75.1	83.8	81.6
B. Highway and Bridge Construction	19.1	41.1	43.0	31.5	25.7
23. Total transportation	256.1	290.2	267.6	313.0	348.0
A. Air Transport	24.5	20.3	9.4	9.8	3.4
B. Water Transport	n.a.	23.0	29.1	30.2	23.8
C. Railways	n.a.	35.9	-9	24.6	184.3
D. Truck Transport	37.8	46.7	49.7	59.4	79.0
E. Pipelines	127.2	126.6	133.1	137.1	147.2
24. Storage	13.6	16.2	15.7	22.8	21.4
A. Grain Elevators	7.0	9.1	10.2	15.3	13.3
B. Storage and Warehouses	5.8	6.6	4.8	7.2	7.6
25. Communications	212.7	230.5	305.6	331.5	367.7
A. Radio and Television	16.6	14.6	17.0	15.8	29.2
B. Telephones	192.9	213.1	285.9	311.9	334.5
26. Public Utilities	92.3	115.7	124.2	137.5	143.9
A. Electrical Power	48.2	44.0	54.7	52.9	61.1
B. Gas Distribution	58.6	65.2	71.4	78.4	78.4
27. Wholesale Trade	369.9	430.8	458.7	503.7	592.0
28. Retail Trade	262.1	306.9	363.9	392.9	429.3
29. Total Finance, Insurance, and Real Estate	1904.8	2834.0	3295.6	4643.6	5435.7
A. Trust Companies	129.0	184.2	196.3	260.5	337.1
B. Mortgage and Loan Companies	258.8	302.3	385.2	449.1	491.4
C. Banking	n.a.	757.3	878.9	1195.3	1688.1
D. Total Deposit Accepting Institutions	384.2	1243.8	1460.6	1905.0	2516.7
E. Total Investment Companies	732.6	801.2	901.8	1064.4	1559.9
a*29. Total Finance, Insurance, and Real Estate	1033.7	1045.3	1250.1	2054.9	2056.9
*A. Trust Companies	20.6	20.8	23.4	26.3	31.7
*B. Mortgage and Loan Companies	54.1	63.4	70.7	75.2	51.8
*C. Banking	n.a.	117.2	124.8	147.8	124.1
*D. Total Deposit Accepting Institutions	68.1	201.3	219.0	249.3	207.5
*E. Total Investment Companies	648.6	674.0	773.7	897.0	1372.4
30. Total Services	247.5	336.2	354.4	423.1	541.0
A. Services to Business and Management	34.8	58.0	58.4	61.0	123.2
B. Personal, etc., Services	230.6	299.0	316.7	386.3	444.2
31. Total Non-Manufacturing	2617.5	2998.4	3374.6	4399.3	4732.3
32. Mining	241.0	277.8	307.7	397.3	356.1
33. Mineral fuels	144.0	139.9	201.0	212.0	297.9
A. Mineral fuels and Petroleum Refineries	295.0	346.9	344.3	394.1	488.1
34. Agriculture	594.4	819.5	575.6	453.7	156.6
b**34. Agriculture	901.1	1101.7	917.1	834.7	562.0
35. Rental Housing	806.9	885.4	977.7	1097.1	1232.3
36. Owner Occupied Housing	1754.7	1890.3	2068.2	2288.1	2524.8
37. Trade (Non-Corporate)	202.2	236.0	263.2	286.9	326.8
38. Total All Activities	8728.9	9791.2	10139.0	11779.9	12576.5

Private income to capital from financial intermediaries in the categories \*29 and \*29A through \*29B includes only income accruing to the equity holders of the companies.

Private income to capital from agriculture in category 34 was estimated after assuming that all non-wage labour in agriculture received an income for their labour equal to that received by the hired workers. In category \*\*34 it was assumed that only owners and employers in agriculture received a wage equal to that of the hired worker, and the labour of family help had a zero social opportunity cost.

TABLE C  
CAPITAL GAINS AND LOSSES ON BUILDINGS AND EQUIPMENT IN CURRENT PRICES  
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	71.7	.8	-141.9	-82.2	-3.6
	A. Food Industries	54.8	.6	-107.8	-62.7	-2.7
	B. Soft Drinks	4.3	.0	-9.3	-5.2	-.2
	C. Breweries and Wineries	12.4	.1	-24.7	-14.2	-.6
2.	Tobacco Products	3.5	.4	-6.0	-4.3	-.1
3.	Rubber Products	7.8	.3	-16.3	-12.4	-1.0
4.	Leather Products	2.1	.7	-3.2	-2.5	-.0
5.	Textile Mills	16.5	-.9	-58.8	-38.7	-12.8
6.	Knitting Mills	1.3	-1.5	-5.5	-3.1	-2.9
7.	Clothing Industry	1.9	-1.2	-5.5	-3.4	-2.1
8.	Wood Industry	11.5	-12.2	-20.8	-41.6	-16.9
9.	Furniture	1.6	-.5	-3.8	-6.1	-2.0
10.	Pulp and Paper and Allied Ind.	114.7	-33.6	-218.9	-116.2	-33.2
	A. Pulp and Paper Mills	107.0	-31.2	-202.5	-177.2	-31.0
	B. Paper Boxes and Convertors	7.7	-2.3	-16.4	-13.1	-2.1
11.	Printing and Publishing	24.8	9.3	-32.8	-26.8	-10.1
	A. Commercial Printing	11.7	4.5	-16.0	-12.6	-5.3
	B. Publishing	13.1	4.8	-16.7	-14.1	-4.7
12.	Primary Metals	125.5	-4.8	-234.9	-164.1	-11.9
13.	Metal Fabricating	34.4	5.9	-66.4	-36.3	11.5
14.	Machinery Industries	24.2	3.6	-43.3	-25.3	8.3
15.	Transportation Equipment	44.3	3.0	-93.7	-52.4	17.2
	A. Aircraft and Parts	7.5	.5	-16.2	-8.7	2.6
	B. Motor Vehicles	29.7	2.1	-65.3	-35.7	12.0
	C. Miscellaneous Transportation	7.1	.4	-12.1	-7.9	2.5
16.	Electrical Industries	21.1	-.9	-41.7	-32.3	-3.0
	A. Electrical Industrial Equip.	7.7	-.3	-14.5	-11.5	-.1
	B. Other Electrical Products	13.4	-.6	-27.2	-20.9	-1.9
17.	Non-Metallic Mineral Products	30.7	-2.4	-61.4	-44.5	-4.4
18.	Petroleum and Coal Refineries	71.7	-5.7	-99.0	-79.2	-5.9
19.	Chemical Industries	53.8	-5.0	-77.1	-80.0	-21.4
20.	Miscellaneous Manufacturing	8.9	1.2	-15.3	-12.9	-.9
21.	Total Manufacturing	673.2	-43.4	-1247.1	-865.1	-96.1
22.	Total Construction	-3.6	-17.5	-18.7	-3.5	-2.7
	A. Building Contractors	-1.1	-5.7	-1.7	1.1	-.9
	B. Highway and Bridge Construction	-1.2	-5.8	-1.7	1.0	-.7
23.	Total Transportation	-182.2	-298.7	-287.2	11.2	-384.0
	A. Air Transport	-3.5	-7.3	-10.9	-.3	-23.6
	B. Water Transport	n.a.	-32.2	-31.8	.8	-40.9
	C. Railways	n.a.	-177.7	-167.0	6.6	-214.1
	D. Truck Transport	-2.4	-8.5	-13.9	-3.1	-15.2
	E. Pipelines	-40.7	-61.3	-54.7	6.5	-83.1
24.	Storage	12.7	5.8	-10.8	-8.3	2.8
	A. Grain Elevators	7.8	4.3	-7.3	-6.1	1.9
	B. Storage and Warehouses	4.2	.9	-3.3	-2.1	.7
25.	Communications	15.3	-65.4	-134.7	-112.3	-64.7
	A. Radio and Television	2.6	-2.1	-8.8	-7.8	-3.0
	B. Telephones	13.4	-62.1	-125.4	-104.0	-61.4
26.	Public Utilities	10.0	-81.7	-154.1	-173.7	-76.5
	A. Electrical Power	5.1	-42.9	-74.5	-80.6	-36.7
	B. Gas Distribution	4.6	-42.0	-77.6	-87.3	-38.7
27.	Wholesale Trade	17.8	19.6	-37.7	-39.1	-20.1
28.	Retail Trade	17.5	22.5	-39.5	-39.7	-21.0
29.	Total Finance, Insurance, and Real Estate	215.3	178.9	-273.9	-229.3	27.5
	A. Trust Companies	2.0	1.3	-2.0	-1.6	.2
	B. Mortgage and Loan Companies	5.7	3.5	-5.0	-3.7	.4
	C. Banking	n.a.	8.9	-13.7	-11.3	1.4
	D. Total Deposit Accepting Institutions	21.1	13.8	-20.8	-16.7	2.1
	E. Total Investment Companies	14.5	11.0	-16.3	-13.1	2.1
30.	Total Services	80.1	62.1	-102.3	-90.7	1.4
	A. Services to Business and Management	1.5	1.0	-4.5	-4.1	-2.8
	B. Personal, etc., Services	89.4	71.3	-105.2	-90.5	12.8
31.	Total Non-Manufacturing	183.2	-174.3	-1059.2	-685.7	-537.3
32.	Mining					
33.	Mineral fuels					
	A. Mineral fuels and Petroleum Refineries					
34.	Agriculture	484.9	586.5	906.6	71.7	499.5
35.	Rental Housing	13.5	606.1	405.7	524.7	847.9
36.	Owner Occupied Housing	29.4	1293.9	858.2	1094.3	1737.3
37.	Trade (non-corporate)	11.3	13.4	-24.7	-25.2	-13.1



TABLE D  
PROPERTY TAXES PAID IN CURRENT PRICES  
(millions of dollars)

Industry	1965	1966	1967	1968	1969
1. Foods and Beverages	23.4	26.5	30.3	31.7	35.6
A. Food Industries	18.5	20.0	22.6	24.3	23.0
B. Soft Drinks	1.2	2.0	2.3	2.1	1.8
C. Breweries and Wineries	3.8	4.5	5.4	5.4	6.8
2. Tobacco Products	2.0	1.2	1.0	1.1	.8
3. Rubber Products	1.5	1.9	2.3	2.4	3.2
4. Leather Products	1.6	1.7	1.9	2.1	2.3
5. Textile Mills	5.6	5.6	6.8	9.5	8.6
6. Knitting Mills	1.2	1.1	1.3	1.8	2.0
7. Clothing Industry	2.5	3.3	3.2	3.7	4.9
8. Wood Industry	5.2	6.6	6.2	7.5	8.2
9. Furniture	1.5	2.6	3.3	5.9	4.3
10. Pulp and Paper and Allied Ind.	24.8	26.7	28.5	34.8	28.7
A. Pulp and Paper Mills	21.6	22.3	23.1	28.2	23.0
B. Paper Boxes and Convertors	3.2	4.4	5.5	6.6	4.4
11. Printing and Publishing	5.2	5.7	5.5	7.1	7.3
A. Commercial Printing	2.9	3.2	3.1	3.7	3.9
B. Publishing	.2	.3	.4	.6	.3
12. Primary Metals	9.6	13.2	10.4	12.8	10.3
13. Metal Fabricating	10.1	12.6	14.1	15.0	16.2
14. Machinery Industries	5.4	6.5	6.0	8.8	8.8
15. Transportation Equipment	13.5	12.5	14.1	15.7	17.7
A. Aircraft and Parts	1.6	2.1	2.8	2.6	1.3
B. Motor Vehicles	9.9	8.1	7.9	9.7	11.6
C. Miscellaneous Transportation	2.0	2.3	3.4	3.3	3.1
16. Electrical Industries	6.3	7.1	7.8	8.8	9.7
A. Electrical Industrial Equip.	3.6	3.9	4.6	5.0	4.9
B. Other Electrical Products	2.7	3.3	3.1	3.9	4.1
17. Non-Metallic Mineral Products	5.3	5.8	7.9	6.6	7.4
18. Petroleum and Coal Refineries	49.0	51.4	22.3	24.3	55.7
19. Chemical Industries	7.8	10.3	10.4	12.0	12.3
20. Miscellaneous Manufacturing	4.4	3.5	4.8	6.1	7.3
21. Total Manufacturing	185.9	205.9	188.2	218.1	251.3
22. Total Construction	15.1	15.5	19.8	28.1	31.2
A. Building Contractors	9.2	8.6	11.4	15.7	13.4
B. Bridge and Highway Construction	1.6	1.9	2.2	2.2	2.7
23. Total Transportation	69.1	85.0	83.2	112.1	114.2
A. Air Transport	1.2	1.4	1.9	2.4	2.2
B. Water Transport	n.a.	2.4	2.5	2.9	2.4
C. Railways	n.a.	51.7	43.0	63.0	19.0
D. Truck Transport	7.7	14.6	19.2	25.7	32.4
E. Pipelines	14.8	10.3	11.5	13.2	16.0
24. Storage	4.1	4.9	5.0	8.5	7.4
A. Grain Elevators	1.4	1.4	1.6	3.4	2.7
B. Storage and Warehouses	2.7	3.5	3.4	5.1	4.2
25. Communications	30.7	22.4	26.4	44.5	51.9
A. Radio and Television	1.4	1.3	1.6	1.5	2.4
B. Telephones	29.3	20.9	24.8	43.0	49.3
26. Public Utilities	15.9	18.4	19.6	23.3	23.2
A. Electrical Power	7.5	8.6	8.2	9.3	8.5
B. Gas Distribution	8.3	9.5	11.2	13.3	14.0
27. Wholesale Trade	34.4	37.2	48.1	54.6	59.2
28. Retail Trade	50.1	67.8	74.9	81.3	103.1
29. Total Finance, Insurance, and Real Estate	133.4	163.8	203.0	234.6	250.9
A. Trust Companies	1.2	1.9	1.8	2.0	1.9
B. Mortgage and Loan Companies	.6	.6	1.0	1.0	2.8
C. Banking	n.a.	5.1	5.9	7.1	4.5
D. Total Deposit Accepting Institutions	1.8	7.6	8.7	10.1	9.2
E. Total Investment Companies	4.7	8.6	8.4	12.5	6.9
30. Total Services	38.0	46.3	53.4	65.4	76.8
A. Services to Business and Management	2.2	3.1	4.2	4.1	6.4
B. Personal, etc., Services	35.0	43.3	49.2	61.3	70.5
31. Total Non-Manufacturing	390.8	461.3	533.4	652.4	717.9
32. Mining	12.9	13.7	15.5	17.2	24.1
33. Mineral fuels		6.7	17.3	25.3	18.9
A. Mineral fuels and Petroleum Refineries	366.6	237.1	324.1	412.4	402.9
34. Agriculture	143.0	155.5	165.4	175.2	185.6
35. Rental Housing	353.7	399.5	464.2	512.8	585.6
36. Owner Occupied Housing	769.3	852.9	981.9	1069.4	1199.8
37. Trade (non-corporate)	27.0	33.6	39.3	43.4	51.9
38. Total All Activities	2200.3	2308.3	2689.8	3112.0	3382.5

TABLE E  
INCOME TAXES PAID IN CURRENT PRICES  
(millions of dollars)

	Industry	1965	1966	1967	1968	1969
1.	Foods and Beverages	166.9	171.4	176.8	204.2	227.8
	A. Food Industries	96.6	91.1	83.2	100.1	119.2
	B. Soft Drinks	9.8	11.3	13.3	13.3	12.1
	C. Breweries and Wineries	60.4	69.0	77.7	89.4	96.4
2.	Tobacco Products	20.7	17.1	23.9	24.0	23.5
3.	Rubber Products	10.8	14.5	19.2	23.2	24.3
4.	Leather Products	4.2	4.4	3.3	6.1	6.6
5.	Textile Mills	30.7	29.6	19.2	37.7	46.5
6.	Knitting Mills	4.1	3.6	4.5	7.0	8.1
7.	Clothing Industry	8.6	10.6	10.6	15.0	15.3
8.	Wood Industry	23.8	22.4	27.0	54.3	66.9
9.	Furniture	4.6	7.4	6.3	9.1	9.7
10.	Pulp and Paper and Allied Ind.	124.0	105.1	101.6	107.7	126.1
	A. Pulp and Paper Mills	105.3	84.1	75.9	80.3	100.7
	B. Paper Boxes and Convertors	18.8	29.0	25.7	26.7	25.5
11.	Printing and Publishing	30.5	39.0	56.9	53.2	62.1
	A. Commercial Printing	9.0	14.1	15.5	16.0	19.4
	B. Publishing	2.9	4.2	5.6	5.8	6.5
12.	Primary Metals	152.0	53.9	86.5	157.2	115.3
13.	Metal Fabricating	68.2	75.8	69.9	75.5	89.0
14.	Machinery Industries	60.7	68.9	65.1	73.0	91.4
15.	Transportation Equipment	131.7	88.1	107.2	159.9	186.6
	A. Aircraft and Parts	2.5	3.3	2.0	5.1	4.4
	B. Motor Vehicles	117.0	72.1	86.7	135.8	162.2
	C. Miscellaneous Transportation	12.0	12.7	18.7	19.0	19.9
16.	Electrical Industries	48.1	64.9	48.2	45.2	54.5
	A. Electrical Industrial Equip.	19.4	25.6	16.5	9.8	8.1
	B. Other Electrical Products	28.7	39.3	32.1	35.4	46.5
17.	Non-Metallic Mineral Products	33.8	34.1	28.0	34.0	39.1
18.	Petroleum and Coal Refineries	38.3	55.8	28.0	41.3	40.1
19.	Chemical Industries	83.2	93.3	92.8	120.4	112.9
20.	Miscellaneous Manufacturing	28.7	31.6	34.1	40.1	50.2
21.	Total Manufacturing	1073.8	991.4	999.2	1288.1	1396.1
22.	Total Construction	48.5	66.2	94.1	106.9	106.5
	A. Building Contractors	16.8	21.8	35.5	38.2	43.5
	B. Bridge and Highway Construction	8.5	8.8	16.2	20.6	17.4
23.	Total Transportation	106.0	137.1	116.6	116.1	117.2
	A. Air Transport	.9	2.6	2.5	.6	.7
	B. Water Transport	n.a.	7.2	9.0	7.6	10.1
	C. Railways	n.a.	61.9	41.0	41.9	30.1
	D. Truck Transport	9.0	16.5	17.1	18.2	20.3
	E. Pipelines	35.6	40.6	36.8	37.9	45.7
24.	Storage	4.4	5.8	6.8	4.7	4.3
	A. Grain Elevators	3.7	4.2	4.9	1.8	1.3
	B. Storage and Warehouses	.7	1.6	2.0	2.9	2.9
25.	Communications	113.4	117.6	90.2	98.7	111.9
	A. Radio and Television	9.7	10.4	11.7	13.4	19.7
	B. Telephones	103.7	107.2	78.3	85.3	92.3
26.	Public Utilities	31.1	36.9	40.4	43.8	43.0
	A. Electrical Power	19.8	21.6	21.4	20.6	20.9
	B. Gas Distribution	11.3	15.3	19.0	21.7	21.6
27.	Wholesale Trade	168.4	211.8	211.4	248.9	261.0
28.	Retail Trade	131.3	145.2	160.3	178.5	198.0
29.	Total Finance, Insurance, and Real Estate	245.9	265.1	288.0	349.2	528.2
	A. Trust Companies	13.9	14.8	12.3	14.6	18.6
	B. Mortgage and Loan Companies	16.0	9.2	12.4	12.8	18.6
	C. Banking	n.a.	98.4	107.8	120.2	234.1
	D. Total Deposit Accepting Institutions	116.2	122.4	132.4	147.6	271.2
	E. Total Investment Companies	35.2	33.6	39.6	64.7	62.9
30.	Total Services	52.5	73.3	94.9	93.7	117.4
	A. Services to Business and Management	16.7	28.3	27.0	27.6	37.2
	B. Personal, etc., Services	35.8	45.0	67.9	66.1	80.2
31.	Total Non-Manufacturing	901.5	1059.0	1102.7	1240.5	1487.5
32.	Mining	89.9	89.9	91.9	111.5	144.9
33.	Mineral fuels	11.5	17.5	58.9	39.8	35.7
	A. Mineral fuels and Petroleum Refineries	49.8	73.3	86.9	81.1	75.8
34.	Agriculture	-81.7	-68.4	-159.1	-187.9	-171.8
35.	Rental Housing					
36.	Owner Occupied Housing	-219.3	-234.9	-259.0	-286.0	-315.0
37.	Trade (non-corporate)	nil	nil	nil	nil	nil
38.	Total All Activities	1775.5	1854.3	1834.5	2205.9	2577.3



TABLE F  
TOTAL SALES TAXES PAID ON THE INCOME FROM CAPITAL  
(millions of dollars)

Industry	1965	1966	1967	1968	1969
1. Foods and Beverages	441.4	486.8	610.8	675.6	731.1
A. Food Industries	9.3	10.0	12.0	12.4	13.0
B. Soft Drinks	7.1	8.4	11.0	12.2	13.6
C. Breweries and Wineries	424.8	468.2	587.7	651.0	704.4
2. Tobacco Products	332.9	375.0	433.7	439.6	453.7
3. Rubber Products	10.1	12.1	14.9	15.8	16.8
4. Leather Products	4.3	6.1	6.3	7.4	8.1
5. Textile Mills	15.9	18.1	19.6	21.9	23.6
6. Knitting Mills	7.0	8.8	10.1	11.3	12.0
7. Clothing Industry	13.5	18.3	17.6	19.0	21.2
8. Wood Industry	1.4	1.6	1.9	1.9	2.3
9. Furniture	7.9	11.4	12.9	13.8	15.9
10. Pulp and Paper and Allied Ind.	8.5	9.1	11.3	11.6	12.9
A. Pulp and Paper Mills	4.1	4.2	4.9	5.3	6.0
B. Paper Boxes and Convertors	4.4	4.9	6.3	6.2	6.8
11. Printing and Publishing	6.5	7.7	9.3	9.3	10.7
A. Commercial Printing	5.9	7.1	8.6	8.6	9.8
B. Publishing	.4	.5	.6	.6	.8
12. Primary Metals	11.9	12.8	13.7	14.9	12.5
13. Metal Fabricating	10.3	12.2	14.1	14.3	15.8
14. Machinery Industries	19.4	23.2	26.0	25.7	28.7
15. Transportation Equipment	148.5	174.5	233.0	289.2	361.7
A. Aircraft and Parts	2.6	4.2	5.7	6.3	5.4
B. Motor Vehicles	144.8	165.4	221.4	276.3	349.2
C. Miscellaneous Transportation	.9	4.7	5.9	6.5	7.1
16. Electrical Industries	51.3	66.5	79.4	85.2	92.1
A. Electrical Industrial Equip.	5.9	6.8	8.2	8.0	8.9
B. Other Electrical Products	45.3	59.7	71.1	77.1	83.2
17. Non-Metallic Mineral Products	5.5	6.6	7.5	7.4	8.2
a18. Petroleum and Coal Refineries	152.6	179.0	115.0	115.6	145.4
19. Chemical Industries	20.5	22.1	24.5	18.6	20.0
20. Miscellaneous Manufacturing	19.6	20.0	23.3	25.7	30.9
21. Total Manufacturing	1289.6	1472.6	1685.6	1824.6	2024.2
22. Total Construction					
A. Building Contractors					
B. Bridge and Highway Construction					
23. Total Transportataon					
A. Air Transport					
B. Water Transport					
C. Railways					
D. Truck Transport					
E. Pipelines					
24. Storage					
A. Grain Elevators					
B. Storage and Warehouses					
25. Communications	9.8	16.4	21.9	26.7	29.3
A. Radio and Television					
B. Telephones	9.8	16.4	21.9	26.7	29.3
26. Public Utilities	11.9	9.5	13.9	14.5	18.6
A. Electrical Power	7.4	4.7	6.9	7.7	8.1
B. Gas Distribution	4.5	4.8	7.0	6.8	10.5
27. Wholesale Trade	16.5	25.2	35.6	42.3	50.9
28. Retail Trade	12.8	19.3	29.7	34.3	40.8
29. Total Finance, Insurance, and Real Estate					
A. Trust Companies					
B. Mortgage and Loan Companies					
C. Banking					
D. Total Deposit Accepting Institutions					
E. Total Investment Companies					
30. Total Services	4.4	6.0	6.6	7.7	9.2
A. Services to Business and Management					
B. Personal, etc., Services	4.4	6.0	6.6	7.7	9.2
31. Total Non-Manufacturing	55.4	76.4	107.7	125.5	148.8
32. Mining					
33. Mineral fuels					
aA. Mineral fuels and Petroleum Refineries	152.6	179.0	115.0	115.6	145.4
34. Agriculture					
35. Rental Housing					
36. Owner Occupied Housing					
37. Trade (non-corporate)	8.7	13.0	18.3	21.7	26.5
38. Total All Activities	1353.7	1562.0	1811.6	1971.8	2199.5

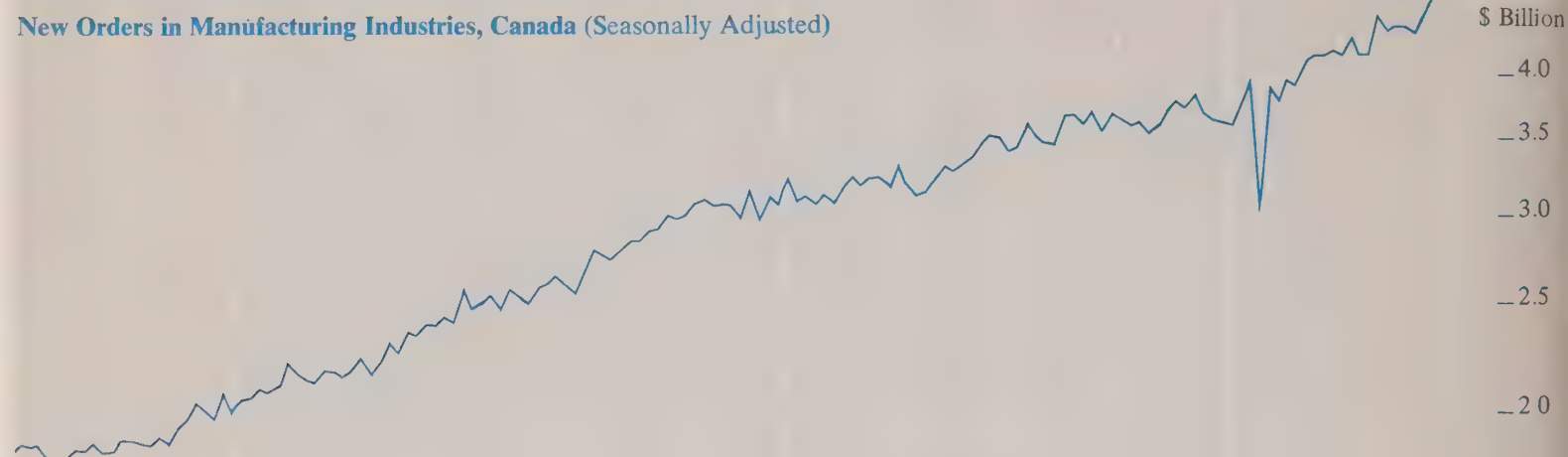
# Selected Economic Indicators

## Leading Indicators

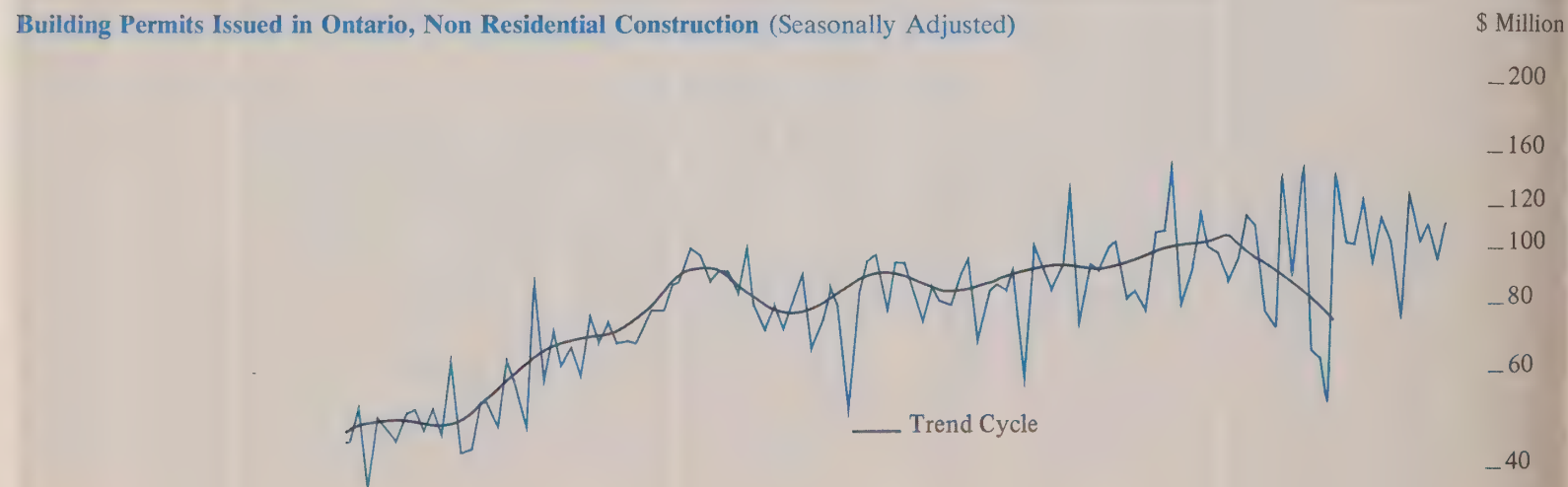
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



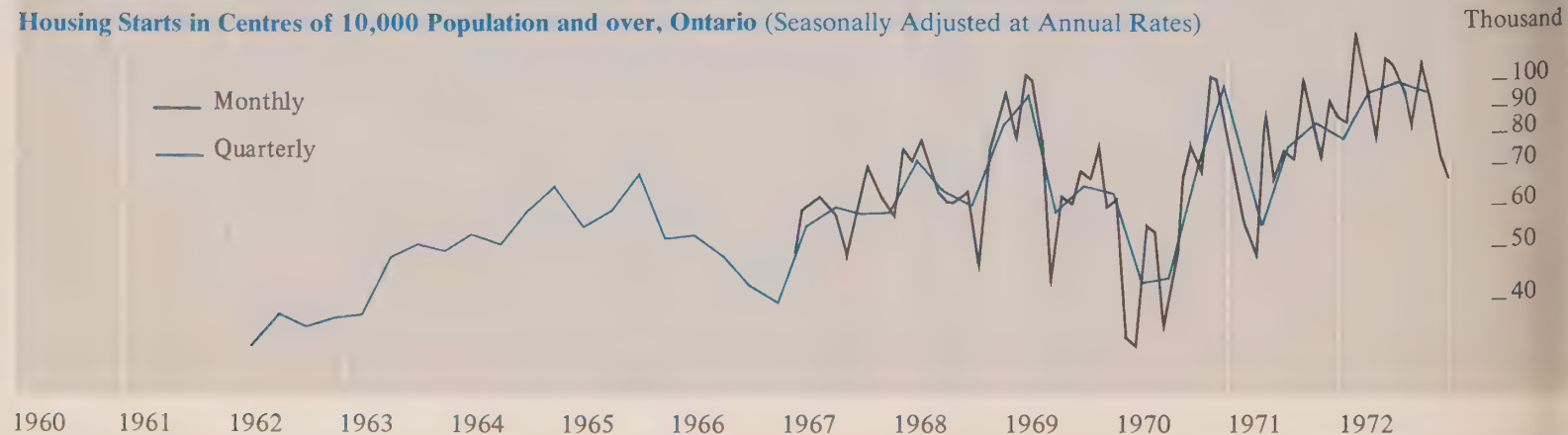
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



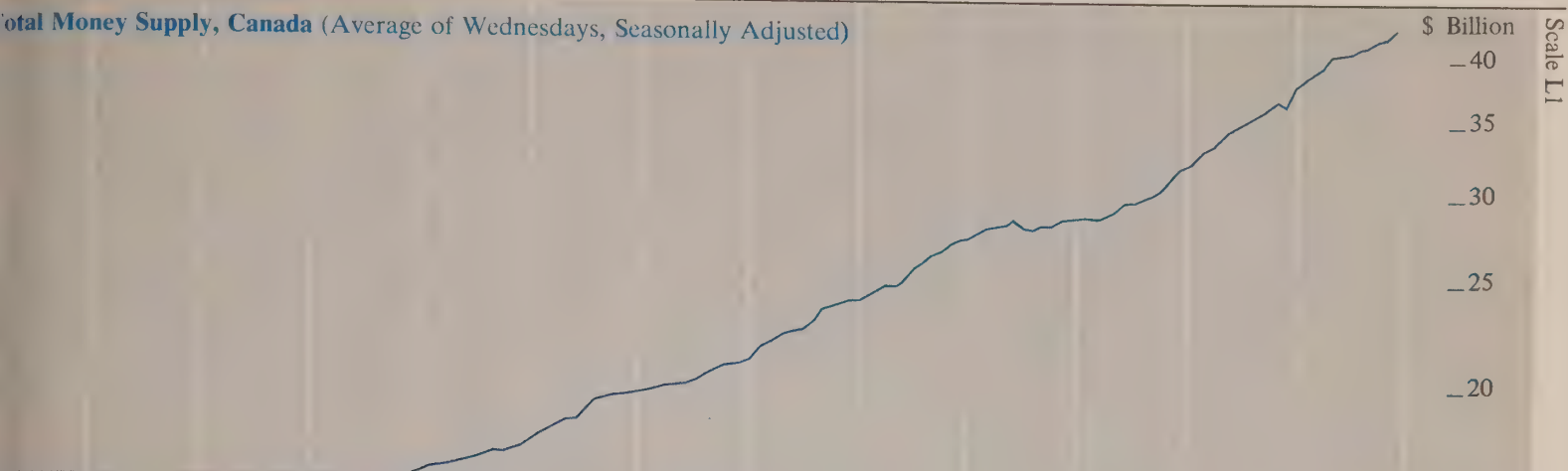
Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)





## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

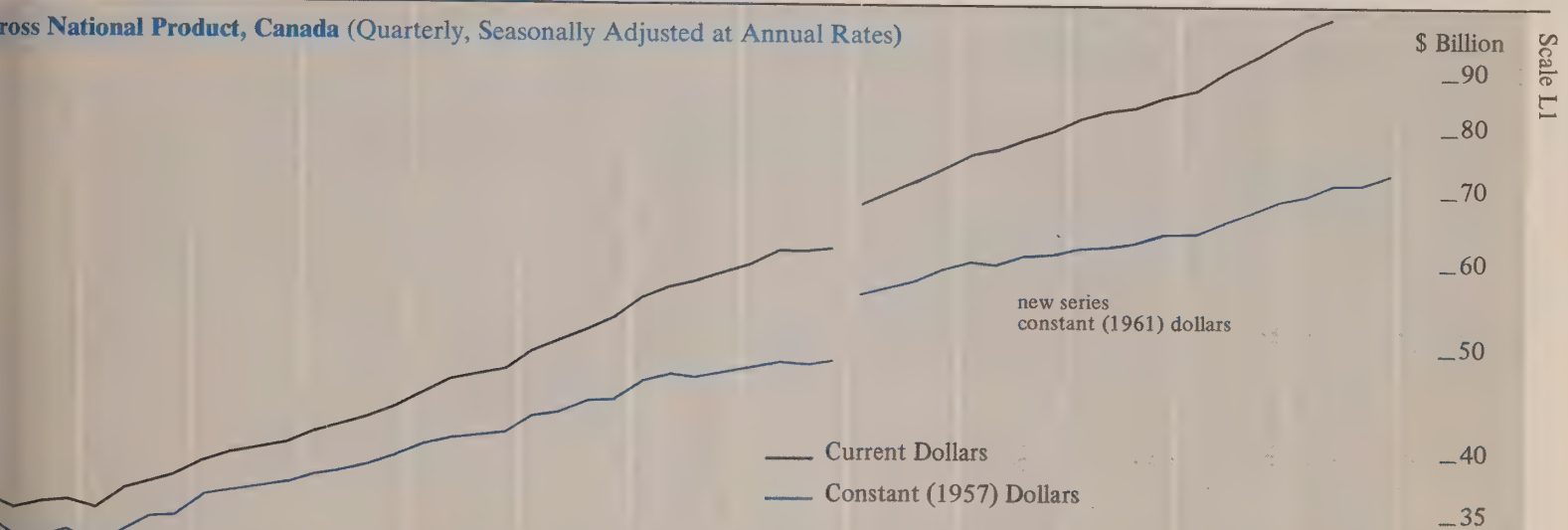


**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

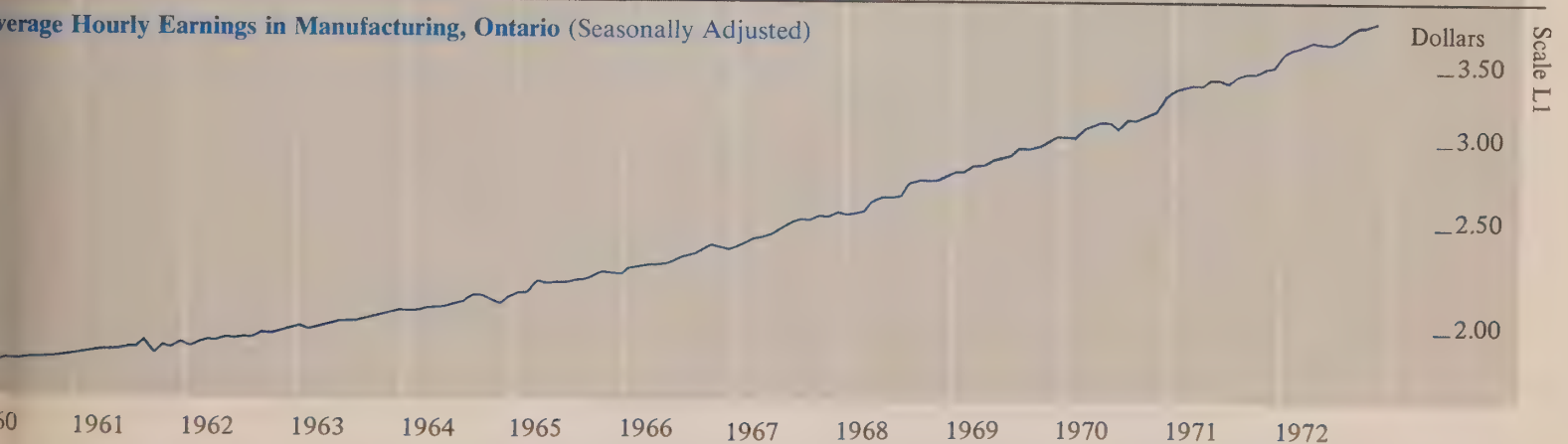


## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

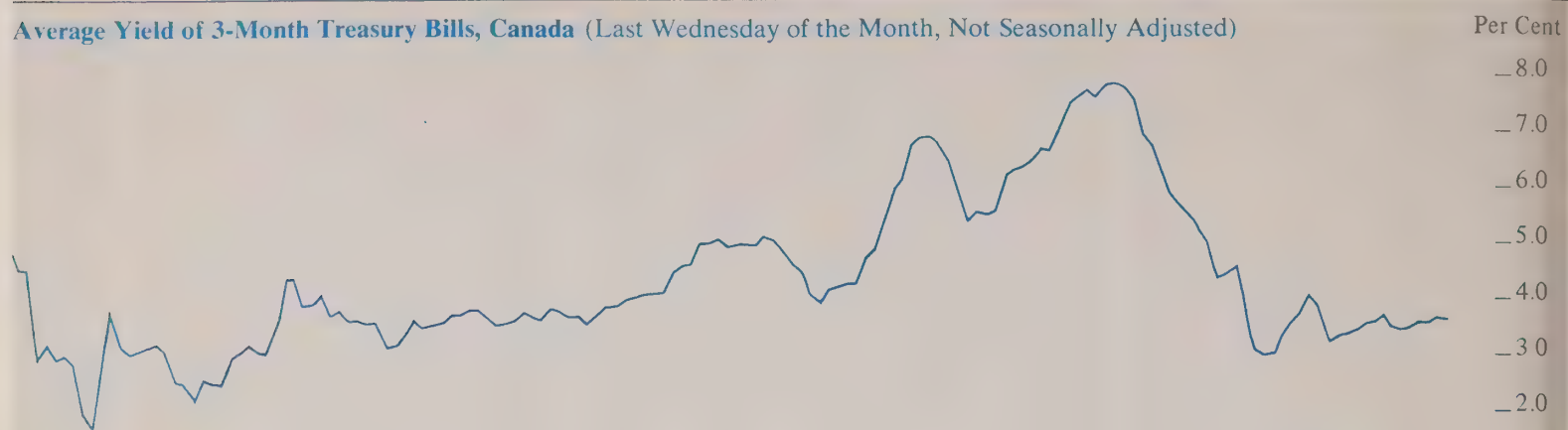


**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)



# Coincidental and Lagging Indicators

**Average Yield of 3-Month Treasury Bills, Canada** (Last Wednesday of the Month, Not Seasonally Adjusted)



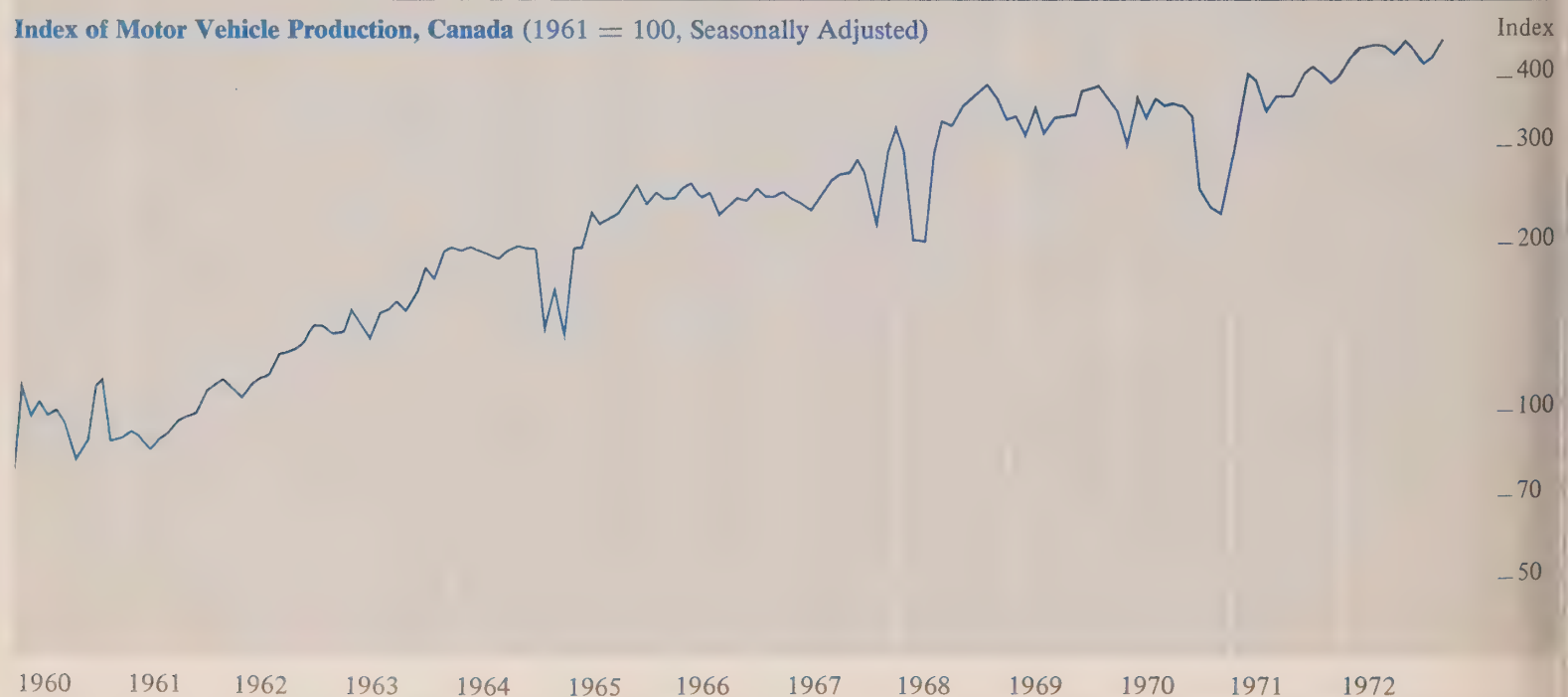
**Employment, Ontario** (Seasonally Adjusted)



**Unemployment Rate, Ontario** (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



**Index of Motor Vehicle Production, Canada** (1961 = 100, Seasonally Adjusted)





		1971			1972												
		Nov.	Dec.		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Leading Indicators																	
Average Weekly Hours Worked in Manufacturing																	
Number		40.0	40.4		40.7	40.1	40.2	40.5	39.7	40.8	39.8	40.1	40.4	40.4	40.2	40.5	
\$ Million		4,267.0	4,216.1		4,368.1	4,213.4	4,234.7	4,563.0	4,439.8	4,488.0	4,459.5	4,402.2	4,561.6	4,745.0	4,760.4	4,836.0	
Building Permits Issued in Ontario, Non-Residential Construction																	
Number		53.1	139.6		103.4	102.5	123.2	95.1	114.7	104.7	76.7	128.2	104.7	110.4	96.7	112.4	
Urban Housing Starts (Annual Rate)		98,500	77,500		82,900	123,100	94,000	78,700	108,600	106,700	97,000	82,700	108,500	91,600	71,800	66,500	
Money Supply <sup>c</sup>		37,016	37,353		38,338	38,656	39,099	39,655	40,507	40,649	40,862	41,280	41,515	42,028	42,287	42,839	
T.S.E. Industrial Index <sup>u</sup>		166.2	181.6		197.3	203.6	197.7	200.0	204.0	199.7	204.8	214.1	210.8	203.2	215.4	221.6	
Business Failures <sup>u</sup>		94	61		44	61	135	78	153	94	84	101	67	100	102	82	
Business Failures — Liabilities <sup>u</sup>		5.7	3.7		3.4	4.7	8.7	9.0	7.7	4.3	3.9	7.4	4.5	4.1	13.8	3.8	
Coincidental and Lagging Indicators																	
Gross National Product <sup>c</sup> (Annual Rate)	\$ Million		96,596				98,992			101,964			103,728			107,056	
Average Hourly Earnings in Manufacturing																	
Dollars		3.52	3.53		3.62	3.66	3.66	3.70	3.69	3.68	3.73	3.79	3.82	3.84	3.86	3.87	
3-Month Treasury Bill Rate <sup>c,u</sup>	Per Cent	3.24	3.21		3.36	3.45	3.57	3.64	3.73	3.50	3.46	3.50	3.62	3.57	3.68	3.65	
Cheques Cashed in Clearing Centres <sup>l</sup>	\$ Million	8,248	8,098		7,627	7,940	7,508	8,010	7,409	8,144	8,437	8,751	8,470	8,936	8,449	8,768	
Retail Trade	\$ Million	1,036	1,013		1,038	1,040	1,042	1,072	1,083	1,081	1,093	1,088	1,098	1,128	1,115	1,107	
Labour Force	000's	3,314	3,318		3,349	3,338	3,366	3,352	3,371	3,370	3,377	3,395	3,408	3,408	3,416	3,441	
Employed	000's	3,135	3,153		3,188	3,185	3,208	3,209	3,220	3,207	3,219	3,224	3,227	3,227	3,243	3,269	
Unemployed	000's	179	165		161	153	158	143	151	163	158	171	181	181	173	172	
Unemployed as % of Labour Force	Per Cent	5.4	5.0		4.8	4.6	4.7	4.3	4.5	4.8	4.7	5.0	5.3	5.3	5.1	5.0	
Wages and Salaries	\$ Million	1,809	1,827		1,853	1,857	1,875	1,894	1,893	1,922	1,923	1,933	1,952	1,973	1,997	2,027	
Index of Industrial Employment	1961 = 100	131.9	131.5		132.2	132.3	133.2	133.9	134.8	134.8	134.4	133.5	134.2	136.2	135.7	134.6	
Index of Industrial Production <sup>c</sup>																	
Total Manufacturing <sup>c</sup>	1961 = 100	187.5	187.8		189.4	189.5	191.1	195.1	192.8	194.0	194.0	192.6	195.4	200.4	202.3	203.3	
Non-Durables <sup>c</sup>		184.0	184.3		186.1	185.0	187.1	191.0	188.3	190.9	191.6	189.8	191.9	194.3	196.0	198.5	
Durables <sup>c</sup>		163.4	163.7		164.5	162.9	165.4	169.4	167.5	172.0	170.4	169.1	171.4	172.7	173.1	175.9	
Mining <sup>c</sup>		210.1	210.3		213.3	213.1	214.6	218.4	214.6	214.8	218.5	216.1	217.9	221.5	225.0	227.1	
Electric Power and Gas Utilities <sup>c</sup>		190.2	190.6		192.2	194.9	193.3	200.8	197.2	189.3	185.3	185.0	192.8	210.9	212.7	206.7	
Primary Energy Demand (Annual Rate)		213.3	213.8		213.5	218.8	221.9	221.3	224.3	228.2	228.3	227.9	229.2	236.4	239.6	239.2	
Exports (including re-exports) <sup>c</sup>	BKWH	70.26	68.83		70.19	72.37	72.63	72.07	71.74	72.90	73.58	73.16	74.64	76.15	76.56	75.43	
Imports <sup>c</sup>	\$ Million	1,507	1,508		1,485	1,580	1,551	1,559	1,675	1,750	1,486	1,600	1,569	1,859	1,982	1,826	
	\$ Million	1,387	1,362		1,496	1,416	1,517	1,525	1,538	1,514	1,532	1,603	1,531	1,667	1,671	1,707	
Unclassified Indicators																	
Foreign Exchange Reserves <sup>c,u</sup>	U.S. \$ Million	4,573	4,852		4,838	4,841	4,903	5,005	5,210	5,376	5,349	5,358	5,370	5,372	5,191	5,189	
Industrial Materials Price Index <sup>c,u</sup>	1935-39 = 100	267.9	269.8		277.1	282.8	291.7	290.6	294.5	295.7	294.9	300.9	303.1	317.4	319.4	325.4	
Consumer Price Index <sup>c,u</sup>	1961 = 100	135.4	136.3		136.7	137.3	137.4	138.2	138.3	138.5	140.2	141.3	141.8	142.0	142.3	143.3	
Toronto <sup>u</sup>		130.5	131.6		132.0	132.8	132.6	133.4	133.4	133.9	135.7	135.9	136.6	136.2	136.6	137.7	
Ottawa <sup>u</sup>		132.3	133.0		133.6	133.9	134.1	135.1	134.7	134.9	136.1	137.4	137.9	137.6	138.2	139.1	
Thunder Bay <sup>u</sup>		104.9	105.4		105.8	106.3	106.3	107.0	107.1	106.6	107.2	108.4	108.9	108.5	109.1	109.5	
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>		0.74	0.73		0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70	0.70	0.70	

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>l</sup>Ontario less Toronto.









THE UNIVERSITY OF TORONTO

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF MATHEMATICS

MAJOR: MATHEMATICS

MINOR: PHYSICS

STUDENT: [Name]

ADVISOR: [Name]

THESIS TITLE: [Title]

ABSTRACT: [Abstract]

INTRODUCTION: [Introduction]

CHAPTER 1: [Chapter 1]

CHAPTER 2: [Chapter 2]

CHAPTER 3: [Chapter 3]

CHAPTER 4: [Chapter 4]

CHAPTER 5: [Chapter 5]

CONCLUSION: [Conclusion]

BIBLIOGRAPHY: [Bibliography]

APPENDIX: [Appendix]

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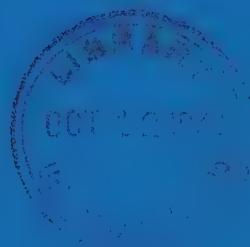


# Ontario Economic Review

January/February 1973  
Volume 11, Number 1

Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. John White,  
Minister of Treasury, Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



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## Canada's Approach to The 1973 GATT Round Fiscal Policy Management and Tax Sharing Reform Conservation of Historic Sites and Buildings in Ontario

H. Ian Macdonald, *Deputy Minister*

Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. John White, *Minister*

Ministry of Treasury, Economics and Intergovernmental Affairs

Local Planning Policy Branch,

Ministry of Treasury, Economics and Intergovernmental Affairs

A publication of the  
Ministry of Treasury, Economics  
and Intergovernmental Affairs  
Government of Ontario

Hon. John White

*Minister of Treasury, Economics  
and Intergovernmental Affairs*

H. Ian Macdonald

*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

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M7A 1Y7

### About the Review

Featured in the January/February edition of the *Ontario Economic Review* are extracts of addresses presented by the Minister of Treasury, Economics and Intergovernmental Affairs, the Honourable John White, and by the Deputy Minister, Mr. H. Ian Macdonald.

At the symposium sponsored by the Canadian Export Association in Toronto in February, Mr. Macdonald highlighted some of the major challenges facing Canadian exporters and explained the reasons behind the gradual shift towards more protectionist trade policies in the U.S. and their possible effects on Canada and Ontario.

Mr. White, in his statement to the Meeting of the Ministers of Finance in Ottawa in January, proposed that the federal government substantially reduce personal income tax to provide stimulus to private incomes, economic expansion and employment.

This proposal, the Minister claimed, would have a very real and psychological anti-inflationary effect on the economy. The Minister further recommended that changes in tax-sharing arrangements be determined to allow the provinces to move in to take up some of the tax room made available by the reduction.

A third article deals with the preservation of historic sites and buildings in Ontario. The article, prepared by the Local Planning Policy Branch, is based on a report which is being used as a basis for legislation.

### Indicator Charts, Pages 9-11

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 9, 10 and 11 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.





## CANADA'S ECONOMIC GROWTH

Throughout the 1960's, as well as in the last few years, Canada's economic growth has been very satisfactory by international standards. Between 1960 and 1971, our real gross national product grew at an average rate of 5.4 per cent per annum and has shown some acceleration in 1972. According to recent estimates, the 1972 growth was about 5.8 per cent in real terms. This growth performance is above the OECD average by almost one percentage point, and although some other countries such as Japan, France and Italy, have been moving faster than Canada, we have certainly not been falling behind.

Our foreign trade performance also provides cause for satisfaction. Canada's share in world exports went up from 4.3 per cent in 1960 to 6.5 per cent in 1970, and in 1972 the value of merchandise exports was almost \$20 billion. The structure of trade has been gradually changing towards a greater emphasis on sales of manufactured end products, whose share in Canada's total exports rose to almost 37 per cent in 1971. On the other hand, these manufactured exports were disproportionately concentrated in automotive products within the Canada Auto Pact.

## Structural Weaknesses and Deficiencies in Economic Growth

An unacceptably high level of unemployment has become one of Canada's crucial economic, social and political problems. Job creation is one of the main objectives of federal and provincial policies, and Canadians will be testing the performance of governments against this criterion.

The character of our job creation problem is unrelated to the second weakness inherent in our Canadian economy: the unsatisfactory rates and growth rates of productivity. While it is generally known that productivity levels in Canadian manufacturing, as expressed by value added per employee, average about 20 to 30 per cent lower than those in the United States, attention has been paid in public debate to the modest productivity advances made in Canada in the last 10 years. Most of Canada's average annual growth rate of 5.4 per cent in the 1960's — equivalent to 3.1 per cent — has been attributed to growth of employment, whereas the average growth rate of "output per person employed" has been only 2.3 per cent. During the same period, productivity growth in the United States has been higher, and some continental European countries and Japan have recorded a productivity growth of between 4.2

per cent and 8.7 per cent per year.

These developments will have serious implications for Canada because they will not only infringe on our competitiveness, but they will also have a negative impact on advances in Canadian material standards of living.

## Some Implications for Tariff Policy

What implications do these internal realities have for Canada's foreign trade policy in general, and its tariff policy in particular? Free trade and low tariffs have generally been considered as powerful means of enforcing productivity at home. Protectionism, on the other hand, has historically been used to preserve or expand domestic job opportunities. It is clear from this situation that we are in a dilemma. If we are too protective, our productivity will suffer. If we move too fast in tariff reductions, our productive resources — manpower in particular — may be under-employed.

Not even the powerful economy of the United States has been able to escape this dilemma, as it has recently been experiencing a convulsive tug-of-war between two opposing camps, one representing the free traders, the other the protectionists. With respect to our relations with the United States, we agree with the prediction made in the statement by the Canadian-American Committee<sup>1</sup> in April 1972 that Canadian and U.S. policies affecting bilateral trade and investment will be more and more argued on the "balance of employment" effects.

Over the last decade, Canada had the highest labour force growth rates among all industrialized countries, and this characteristic is expected to continue throughout the 1970's. The formidable challenge of providing employment for a rapidly growing population hangs over the whole process of policy formulation in Canada. No program aimed at abolishing tariffs or creating freer trade will be socially and politically appealing in this country if it invokes the danger of aggravating our employment situation. The solution has to be found in a pragmatic approach to tariff negotiations, where benefits to the Canadian economy are weighted against possible sacrifices.

## CHANGING ATTITUDES TOWARDS THE UNITED STATES

If we ask ourselves what changes occurred in Canadian attitudes towards the United States in the late sixties and early seventies, it seems clear that more and more Canadians have become seriously concerned about the growing

American ownership and control of Canadian industries. That concern has found various forms of expression and has finally influenced, in varying degrees, the programs of all major political parties.

In a 1972 address, "*Canada-U.S. Relations: Options for the Future*"<sup>2</sup>, the Secretary of State for External Affairs, the Honourable Mitchell Sharp, suggested there are three options available:

- 1) Canada can seek to maintain more or less its present relationship with the United States with a minimum of policy adjustments;
- 2) Canada can move deliberately towards closer integration with the United States;
- 3) Canada can pursue a comprehensive long-term strategy to develop and to strengthen the Canadian economy and other aspects of its national life and in the process to reduce the present Canadian vulnerability.

The third option has been recognized as the one best serving the interests of Canada. The views expressed in Mr. Sharp's report are compatible with Ontario's position on foreign investment which has been described as moderate economic nationalism. The essence of this position lies in its emphasis on positive measures to strengthen Canadian entrepreneurship, ownership and control, and less on restrictive regulations.

## The Cost of Sovereignty

There is, of course, a price on sovereignty. Mr. George Ball, the former U.S. Under-Secretary of State, even suggested an explicit price tag. Speaking to a National Industrial Conference Board meeting in New York on January 18, 1973, he said that the 20 to 25 per cent difference in GNP per capita between Canada and the United States is the price Canadians are paying for sovereignty. "Of course", he added, "the decision is theirs".

The concept of a customs or economic union with the United States seems to be a rather distant possibility. This does not, of course, preclude the probability of some sectoral free trade agreements, especially in areas where the danger of production losses to Canada would not be excessive. For Canada, trade expansion with the United States is a vital necessity. We need access to the U.S. market for our raw and fabricated materials and, even more so, for our manufactured products. At the same time, however, it should be remembered

that we are the world's largest buyer of American goods. In fact, Canada is much more vulnerable to an unfavourable climate in international trade since exports constitute a much larger share of our GNP than in the United States. We are, therefore, very sensitive to any tendencies in the United States towards protectionism.

### Protectionism

Today, there are valid reasons for concern, as there have been since 1967, when the first protectionist tendencies began to appear in the United States. This was the time when a change was occurring in the competitiveness of U.S. goods in world trade and the first deficits began to appear. Problems started to affect U.S. industries producing textiles, shoes, glass and ceramics, pianos, and other goods, and *ad hoc* solutions were found in import restrictions. In the last three to four years, several hundred bills were presented in the U.S. Congress to increase protection from imports; as a result, the formerly hospitable trade climate in the United States cooled off considerably. In 1971, the Hartke-Burke Bill was presented, incorporating the totality of protectionism in trade and foreign investment. Most observers of the U.S. do not give this Bill a chance of being passed, yet they expect that a substantial number of its component parts may reach U.S. legislation in a dispersed way through other bills.

The strength of the protectionist camp is being assessed by U.S. experts in the following way: labour is behind the Hartke-Burke Bill. The U.S. steel industry has been protectionist since the early 1960's; more recently, the traditionally free trade-oriented American farmers have become resentful of the common agricultural policy of the European Community. If they were to join organized labour, the prospects for a continued liberal trade policy would be rather dim.

### The EEC and Japan

The feeling is also spreading in U.S. public opinion that the European Common Market has now gone beyond the goals originally supported by the United States, and that the enlargement of the EEC works against the interests of the United States. If one adds the feeling in the United States that Japan has not reciprocated

adequately in liberalizing its imports and investments from abroad, one can see a rather forbidding climate in which U.S. trade moves may be made in the immediate future. The difficulties which the U.S. economy is experiencing in foreign trade and in external financial relations find synthetic expression in the U.S. balance of payments and its balance of trade. There is no need here to recall the whole scenario of the recent devaluation of the U.S. dollar. The important thing for Canadians is to demonstrate effectively that there is no reason for the United States to retaliate in trade against Canada.

### CANADA'S TRADE AND PAYMENTS BALANCE WITH THE UNITED STATES

It was only in 1968 that, for the first time in our history, we recorded a trade surplus with the United States — about a quarter of a billion dollars. In the last three years, our annual surpluses in merchandise trade with the United States were at a level of approximately one billion dollars. However, the invisibles account has been recording an ever deepening deficit for Canada. Last year, our imbalance on services with the United States amounted to as much as \$1.5 billion. As a result, our current account deficit with the United States over the last five years recorded a total of \$2.7 billion.

Can the U.S. Government have any basis whatsoever for insisting on curbing our surplus on merchandise trade while ignoring the fact

that, due to high remittances from Canadian royalties, interest and dividends, the United States has been running uninterrupted surplus on total (visible *plus* invisible) bilateral trade.

There does not appear to be any such likelihood and most likely the more thoughtful elements in the U.S. Administration also realize this. The most encouraging that Mr. George Schultz, U.S. Secretary of the Treasury, did not shout out Canada for possible U.S. retaliatory measures in the recent dollar crisis, when he spoke about adjustments expected to be made by U.S. trading partners as a contribution to solving the crisis.

Let us hope that reason and goodwill prevail in the U.S. Government, and serious confrontation with Canada on the trade issue can be avoided. Canadian merchandise surpluses with the United States should be recognized as a natural and inescapable feature of our unique economic relations, characterized by high Canadian transfers to the United States of funds representing the servicing of our indebtedness.

It is to be hoped that the U.S. Administration will find understanding for such a Canadian position, for the long-term interests of both the United States and Canada are not only compatible but also convergent. It is in the interests of both countries to preserve and strengthen prosperity on the whole North American continent, as our interests vis-a-vis the rest of the world make us undoubted allies.

Canada's Current Account Balances with the United States, 1968-72  
(millions of \$ Canadian)

Year	Balance on Merchandise Trade	Balance on Services	Current Account Balance
1968	+ 249	-1,041	-
1969	+ 336	-1,321	-
1970	+1,041	-1,306	-
1971	+1,126	-1,386	-
1972	+1,052	-1,499	-
Total 5 years	+3,804	-6,553	-2,749

Source: Statistics Canada

<sup>1</sup> Canadian-American Committee, *The New Environment for Canadian-American Relations* (Montreal: Private Planning Association of Canada, 1972).

<sup>2</sup> The address was presented by the Hon. Mitchell Sharp at the Annual Meeting of the Certified General Accountants' Association, in Toronto, Oct. 18, 1972.



# Fiscal Policy Management and Tax Sharing Reform

John White, Minister

Ministry of Treasury, Economics and Intergovernmental Affairs

Addressing the Finance Ministers' Meeting in Ottawa on January 18, Mr. White emphasized the items of "paramount importance" facing the Canadian economy — the immediate need for bold programs to reduce unemployment, to encourage economic expansion and contain inflation, and the urgent need for redistribution of resources to the provinces in order to avoid otherwise inevitable tax increases and cuts in essential public services.

These priority objectives, the Treasurer maintained, could be met by a single fiscal reform on the part of the federal government — a reduction in personal income tax. The Government of Ontario urged a \$1 billion tax cut to provide immediate stimulus to private incomes, economic expansion and employment, and also to open up essential tax room for the provinces over the longer run.

The following extract is based on Ontario's proposals as presented by the Minister in his statement.

## FISCAL POLICY MANAGEMENT

The economic record of the past year has been unsatisfactory. After four years of federal attempts to stabilize the economy, we are no better off than before, with unemployment averaging 6.3 per cent in 1972 and the rate of inflation reaching 4.8 per cent. In the fourth quarter of 1972, the seasonally adjusted rate of unemployment reached 6.7 per cent. The economy has suffered permanent losses in output and incomes, and the goal of full employment is as distant as ever.

In 1969 the federal government implemented deflationary monetary and fiscal policies to stem the rising tide of inflation. Then, the Consumer Price Index had risen by 4.5 per cent over 1968, continuing a rising trend from 1965 when a gain of 3.7 per cent was recorded. The rate of unemployment averaged 4.7 per cent in 1969, which is not a low level in terms of the economy's potential. The impact of restrictive policies was immediate and dramatic. In 1970, the rate of price inflation declined to 3.5 per cent, but the rate of unemployment rose to 5.9 per cent. These trends continued in 1971, when unemployment rose to a ten-year high of 6.5 per cent. Thus, for almost three years running we have been experiencing levels of unemployment in excess of 6.0 per cent. This situation must not be allowed to continue.

The Economic Council of Canada has tabled long-term goals of 6.0 per cent real growth, 3 per cent unemployment by 1975 and an

average rate of inflation of 3.0 per cent over the 1972-75 period.<sup>1</sup> These goals are a compromise between what is attainable and the unsatisfactory record of recent years; besides, we are moving away from these goals instead of towards them. The goals are to be applauded, but the economy needs immediate and significant relief if they are to be attained. Ontario believes that full employment can be regained before 1975 if the federal government uses the maximum fiscal leverage at its disposal.

## The Federal Performance

During the past four years Ontario has carefully monitored the progress of the economy and examined the economic and fiscal policies of the government sector in Canada. We have found much lacking in the conduct of federal fiscal policy.<sup>2</sup> The record shows that the actual fiscal impact of federal policy has been much less than we have been led to believe in successive budget statements. An examination of the course of federal fiscal policy since 1970 reveals a poorly planned and unco-ordinated variety of measures that have almost totally failed in reaching their objectives.

## Federal Policy since 1970

The March, 1970 Budget correctly predicted a deceleration in the rate of growth in output as well as some increase in unemployment. The result was that the rate of unemployment rose rapidly during the year, averaging well over 6.0 per cent in the second half of that year. Cash requirements in the March Budget were a modest \$525 million. This figure was revised upwards in the December, 1970 Budget to \$1.6 billion as plans for additional spending were introduced in response to the deteriorating situation. The December, 1970 Budget message stated:

"Of prime importance is the fact that employment is rising in Canada and unemployment on a seasonally adjusted basis appears to be falling."<sup>3</sup>

Tax cuts were ruled out as a policy measure because:

"A reduction in taxes would be stimulating, that is not to be doubted. But the positive programs which I have described will

not only be stimulating but will penetrate more surely to the particular points of the economy where stimulus and relief of economic hardships are most required."<sup>4</sup>

The fiscal impact of the 1970-71 financial program fell far short of intentions. Actual cash requirements were below expectations, reaching \$1 billion as compared with the forecast \$1.6 billion. The shortfall was considerably greater than indicated as revenues fell by more than \$400 million below forecast because of greater than anticipated weakness in the economy. Thus, a combination of delays in recognizing the urgency of the problem and of carrying out policy, once determined, rendered fiscal policy virtually impotent in 1970-71.

The same situation arose in fiscal 1971-72. The June, 1971 federal Budget again took an optimistic view of the unemployment situation:

"Unemployment is now well below its peak of last fall and the trend will continue downwards."<sup>5</sup>

This optimism dissipated rapidly, with the stronger upsurge in unemployment in the last five months of the year, and the June Budget forecast of total cash requirements of \$2.4 billion was raised to \$2.6 billion in October. The final cash requirements and fiscal impact figure for the year was, however, about \$1 billion lower, even though the June Budget belatedly eliminated the 3 per cent personal and corporate income tax surcharges.

In the 1971 Ontario Budget two months earlier, we had recommended the elimination of these surtaxes. Further, we urged additional tax cuts:

"We believe that immediate and significant tax cuts are required in two main areas:

- first, personal income taxes should be cut in order to bolster consumer purchasing power;
- second, corporate taxation should be reduced in order to restore business confidence and stimulate investment and economic growth."<sup>6</sup>

It was not until the October 14 emergency measures were introduced that the federal government introduced temporary personal and corporate income tax cuts (three per cent and seven per cent respectively). The personal income tax cut was immediately matched by Ontario. The Province had already moved on the corporate side with a five per cent corporate investment tax credit in its April, 1971 Budget.

As previously mentioned, with actual cash requirements once again well below expectations, federal fiscal policy in 1971-72 was far less stimulating than desired. The situation in fiscal 1972-73 is little better. In our own 1972 Budget, in March, we said:

"It is not axiomatic that the only way out of the unemployment problem is through inflated public spending."<sup>7</sup>

Yet, in terms of measures directed to the short-term stimulation of the economy, the emphasis on increases in spending was continued in the May 8 Budget. The federal Budget message exuded confidence:

"Summing up, the Canadian economy is expanding firmly and steadily. . . the mood of the economy is one of growing confidence. . . confidence is contagious and I believe it is spreading."<sup>8</sup>

And, on unemployment:

"I expect that unemployment will fall on the average in the course of this year. . . We do not expect that food prices will rise as fast this year as last. . ."<sup>9</sup>

Following this Budget, the unemployment rate climbed steeply, and it has averaged 6.3 per cent for 1972. Thus, in 1972 we experienced intolerably high levels of unemployment for the third straight year. The Consumer Price Index recorded a gain in 1972 greater than that of 1969 when the battle began, and food prices recorded the largest increase.

We are led to understand that cash requirements for the current fiscal year will be about \$2 billion. On the basis of past performance, we would be inclined to disregard this forecast and anticipate a lower figure, not greater than that for 1971-72. Excluding U.I.C. transfers, cash requirements so far have amounted to less than \$400 million. In addition, the greater elasticity of the new tax system is generating extremely

#### Federal and Ontario Cash Requirements, 1969/70-1973/74

	69/70	70/71	71/72	72/73**	73/74
Federal cash requirements*					
(\$ billion)	-0.2	1.2	1.5	1.7	1.8
— per cent of gross budgetary revenue	1.5%	9.2%	10.9%	10.8%	5.4%
Ontario cash requirements					
(\$ billion)	0.2	0.6	1.0	1.0	1.0
— per cent of gross budgetary revenue	5.4%	10.9%	18.8%	16.3%	17.4%

\* Excluding foreign exchange requirements.

\*\* Estimated, Ontario Treasury.

Source: Department of Finance, Economic Review  
Ministry of TE & IA, Ontario Budgets

strong revenue flows. Therefore, apart from the unplanned and enormous U.I.C. drain — which is admittedly stimulating spending — federal fiscal policy plans appear to have fallen flat again this year.

#### Ontario's Performance

Since 1970-71, our cash requirements relative to total revenues have far exceeded those of the federal government. But, having maintained an expansionary policy stance for the past three years, the Ontario Government now finds it imperative for reasons of budgetary control and future fiscal policy flexibility to reduce the level of its overall cash deficit. In the upcoming year, notwithstanding severe expenditure restraint, our total cash requirements in the absence of tax increases will be around \$1 billion for the third consecutive year. We simply cannot afford stabilization costs of this magnitude. Yet, in 1973-74, Ontario's fiscal effort is projected to exceed by far that of Ottawa if no significant federal initiatives are taken.

#### The Outlook for 1973-74

For the 1973-74 fiscal year, federal cash requirements are currently forecast to be sub-

stantially reduced. This is unwise, and it is to indicate that the federal battle to create is over, whereas the record of the past 10 years shows that it has hardly begun. Ontario urges the federal government to move with courage and conviction in designing its plan for 1973-74, and to learn from past experience. The economy needs a substantial personal income tax cut to take up the slack. In return, the Government of Ontario pledges co-operation in any short-term anti-inflationary measures that might be required. In making this pledge, the Province recognizes the federal government's continuing concern with inflation.

In planning an appropriate fiscal position for 1973, the federal government must consider the fiscal drag associated with the tax system and the provincial-municipal position. As our previous treasurer correctly anticipated during the debate on tax reform, there is mounting evidence that the new system is considerably more elastic than the old. Preliminary estimates of the 1972 federal personal income tax assessed indicate an increase of 27 per cent over the comparable federal government personal income tax in 1971. The increase in the whole of 1971 over 1970 was 15 per cent. The greater elasticity of federal revenues under this new system has



ly neutralized the fiscal stimulation included in the last federal Budget. It is highly important that this revenue drag be offset by appropriate initiatives in the fiscal policy field, as the suggested cut in personal income

#### or Tax Cut Recommended

January 4, the Government of Canada, in Speech from the Throne, assigned the high-priority to reducing unemployment, containing inflation and strengthening the economy.<sup>10</sup> The major specific measures to be undertaken are, in fact, a continuation of existing programs: for example, increased funding of Local Initiatives Program, on-the-job training and the seasonal capital works project. These initiatives represent a continuation of earlier attempts to spend the economy out of crisis. Expenditure programs such as the recent Winter Works Program have a major disadvantage in that they involve a rather long administrative lag and thus are likely to be ineffective in the short run.

The Ontario Government maintains that a substantial federal personal income tax cut would have a beneficial impact on the economy. This initiative would stimulate growth in spending, jobs and incomes, while at the same time having a very real and psychological anti-inflationary effect on the economy, long overdue.

The Province urges the federal government to introduce an immediate reduction of \$1 billion in its personal income tax. Further, we recommend that this tax cut be permanent, and a change in tax-sharing arrangements be worked out to allow the provinces to move in and take up some of the tax room made available by the reduction.

Ontario's prime concern is to see a robust economy. We earnestly believe the federal government can well afford to take this initiative to stimulate the private sector. Our estimates indicate that over one-half of the \$1 billion tax cut would be recouped in fiscal 1973-74 through its expansionary effect on incomes and profits. That is, revenues will be higher and U.I.C. payments lower. After two years, the deficit will be more than completely recovered. A similar experience was found in the United States in 1962 after a U.S. income tax cut. In fact, if Canada can get down to 4.0 per cent unemployment, the federal government could recover a substantial part of the cost of the tax cut through reduced advances to the U.I.C. alone.

Ontario is not asking the federal government to sacrifice its own programs or priorities. We

are simply asking the central authority to relinquish the unintended revenue gains from tax reform. This abatement in taxes will not impair the ability of the federal government to fulfil its role in stabilizing the economy. Rather, it will put the provinces on a sounder financial footing and allow them to complement federal stabilization actions in the future.

#### REFORM OF TAX SHARING

In calling for a significant income tax cut by the federal government, Ontario has kept in mind the crucial links between tax reform, tax sharing, and fiscal policy co-ordination.<sup>11</sup> A tax cut at this time would be stimulating, non-inflationary and self-financing. It would also establish the basis for fundamental reforms in our system of federal-provincial finance. Specifically, a tax cut would:

- make available immediate tax room for the provinces and reserve additional room to take up when the economy has recovered;
- arrest the growth of the public sector by containing tax levels;
- help to restore greater uniformity in income tax levels within Canada.

#### Fiscal Imbalance

The basic problem facing our federal system today is that the federal government is over-financed while the provinces and municipalities are underfinanced. This imbalance was documented in the *Tax Structure Committee Report of 1966* and has been confirmed in subsequent updates and by other studies.

The evidence proves that the federal government's revenues have consistently exceeded its own-account expenditures. Data for recent fiscal years indicate that the federal government would have been in an even stronger financial position had the economy not performed significantly below potential, necessitating large pay-outs in respect to unemployment insurance. Our analysis of federal budgetary trends confirms that even with low economic performance, federal revenues will grow at least five per cent faster than expenditures in the years ahead.

In contrast, the expenditures of the provinces and municipalities have long exceeded their revenues, leaving them in a state of chronic deficit in spite of regular tax increases. The provincial-municipal sector is already underfinanced by more than three billion dollars in 1972-73. Without additional tax sharing this position will continue to deteriorate, since

expenditure growth continues to outstrip normal growth in revenues.

Income tax reform has served to reinforce the surplus revenue potential of the federal government. The revenue gains resulting from the higher elasticity of the new income tax system are already evident from the revenue flows during 1972.<sup>12</sup> As Ontario showed in the papers it tabled at the Jasper Conference of Finance Ministers, these revenue gains accrue almost entirely to the federal government. Consequently, the provinces have been presented with a *de facto* loss in tax sharing.<sup>13</sup>

The federal government's five-year revenue guarantee in effect acknowledges this loss in tax sharing, but to date no steps have been taken to counter the long run deterioration of the provincial position. At a more general level, the inadequacy of the Canadian revenue sharing system — and its deterioration under tax reform — is demonstrated by eight provinces having been forced to levy personal income taxes in excess of the 30.5 per cent "recognized" for sharing purposes by the federal government.

The surplus taxing power accumulating in the hands of the federal government has enabled it to exert financial leverage on the provinces by initiating new shared-cost programs, many of which are not in accord with provincial priorities. At the same time that Ottawa has been enjoying large fiscal dividends, provincial and municipal revenues have not grown fast enough to finance existing programs, let alone to meet emerging priorities such as urban transportation and environment improvement. Indeed, the situation is so serious that Ontario has been forced to make massive expenditure cutbacks and to defer additional financial aid to our local governments. The current imbalance is most graphically displayed by the fact that the Ontario Government faces a \$1.1 billion cash deficit in 1973-74, even after severe expenditure restraint. This exceeds the potential deficit which the federal government faces for Canada as a whole.

#### Consequences of Fiscal Imbalance

Barring a significant transfer of tax resources from Ottawa to the provinces, Ontario will be forced to raise its own taxes, merely to finance the essential public services for which it is responsible. But it is clear that such unilateral provincial tax increases are not the answer to the problems confronting us. The consequences of such an approach would be ominous.

Firstly, this would entail higher income tax burdens for our citizens, and we believe that tax levels are already very high. Moreover, since

many provincial levies have a regressive incidence, increased provincial taxation would tend to negate the equity objective of federal and provincial tax reform programs. Ontario's successful effort to resist income tax increases has been an important anchor against the tide of ever increasing total tax burdens.

Secondly, federally induced provincial tax increases, combined with continued federal program invention, would lead inexorably to an expansion of the public sector. One adverse consequence of this would be increased inflationary pressures. Ontario has consistently taken the position that the total government sector is already large enough, and that it ought to be contained near its present level.<sup>14</sup>

Thirdly, unilateral provincial tax increases would lead to a further balkanization of the national tax structure. In the future, disparity in income tax burdens within Canada is likely to widen as different provinces are driven by financial necessity to regular tax increases.

Finally, independent taxing would increase the likelihood of provinces inadvertently offsetting federal policy. In the past, Ontario has used the limited budgetary flexibility at its disposal to initiate required stabilization action and to complement federal efforts. Now Ontario no longer has the financial resources to undertake complementary tax cuts when they are required to stimulate economic activity. Accordingly, we must point out that without fiscal realignment provinces could be forced into tax actions which counteract expansionary policies undertaken by the federal government.

### Ontario's Solution

To avoid such adverse developments, Ontario has presented a plan for an orderly reform of the tax-sharing system. The Province's proposals were first presented at the Jasper Conference and have been reiterated several times since. The Jasper proposal called for a staged reduction in federal income tax by three per cent in 1973, rising to six per cent in 1974,

eight per cent in 1975, and 10 per cent in 1976.<sup>15</sup> The standard provincial tax rate would be increased by comparable steps until it reached 40.5 per cent in 1976. This timetable of federal income tax reductions and compensating provincial increases follows essentially the same pattern as the staged abatement increases of the early 1960's. This approach would correct the existing fiscal imbalance without increasing total tax burdens, and would achieve a fairer division of future revenue growth between the two levels of government.

The first step towards this overdue reform of tax sharing was called for by Premier Davis in December in a letter to the Prime Minister of Canada. Mr. Davis urged a continuation of the three per cent federal tax cut and a further four per cent federal tax cut effective immediately, which would be taken up by the provinces to achieve improved tax sharing. This strategy would take into account the need for fiscal stimulation of the economy and would also help to avoid the otherwise inevitable increases in the total tax burden in Canada.

Today, Ontario is calling for a one billion dollar income tax cut, consisting of a continuation of the three per cent cut now in effect, plus a further cut of six per cent to be effective immediately. This simply accelerates the long-term plan Ontario advocated in Jasper in order to provide the major fiscal stimulus which the economy so urgently needs. Our current proposal would provide a five per cent tax cut to taxpayers plus four per cent of income tax room for the provinces to take up in 1973. Then, as the economy improves in 1974 and beyond, provinces could gradually assume the five per cent additional occupancy already reserved. This plan does not imply an impairment of federal ability to finance its own expenditures in the long run. The savings in payments to the U.I.C. fund and the revenue growth generated from increased economic activity will quickly restore the absolute level of federal financing.

### The Shared-Cost Programs

From a longer-run point of view, refinancing the government sector involves reforming shared-cost programs. Experience both here and abroad indicates that conditional grant programs interfere with provincial priorities, are administratively inefficient and are relatively unresponsive to local needs.<sup>16</sup> Ontario has indicated that it would like to opt out of the shared-cost programs in exchange for an increased share of the personal income tax. In its Jasper papers, Ontario proposed that a reasonable long-run adjustment would consist of a transfer of 21 points of the personal income tax to the provinces. This fiscal equivalence would provide no financial gain or loss to either level of government but would achieve the accountability, flexibility and simplicity obviously needed in this area of federal-provincial finance.

### CONCLUSION

It must be stressed that we have now reached a critical juncture in federal-provincial relations. The time has come for a bold fiscal initiative to stimulate the economy and to rectify the fiscal imbalance undermining our federal system. The major cut in federal income tax proposed by Ontario is the key for meeting these vital objectives.

The recent course of events makes things clear. The federal government must reactivate the economy to full employment and use the full weight of its fiscal power. And the provinces must inevitably secure a larger share of total income tax revenue to finance essential local services.

The plan Ontario has advanced will achieve both these essential reforms in a way which serves the interests of all of our citizens. We offer this plan in the spirit of goodwill to assure the federal government of our cooperation if this proposal is adopted.

<sup>1</sup> *Economic Council of Canada, Ninth Annual Review: The Years to 1980* (Ottawa: 1972).

<sup>2</sup> *Hon. W. Darcy McKeough, The Reconstruction of Economic and Fiscal Policy in Canada* (Toronto: Department of Treasury and Economics, 1971).

<sup>3</sup> *Hon. Edgar J. Benson, Budget Speech* (Ottawa: December 3, 1970).

<sup>4</sup> *Ibid.*

<sup>5</sup> *Hon. Edgar J. Benson, Budget Speech* (Ottawa: June 18, 1971).

<sup>6</sup> *Hon. W. Darcy McKeough, Ontario Budget 1971* (Toronto: Department of Treasury and Economics, 1971) p. 24.

<sup>7</sup> *Hon. W. Darcy McKeough, Ontario Budget 1972*

(Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972) p. 20.

<sup>8</sup> *Hon. John N. Turner, Budget Speech* (Ottawa: May 8, 1972).

<sup>9</sup> *Ibid.*

<sup>10</sup> *Rt. Hon. P. E. Trudeau, Speech from the Throne, Commons Debates, Ottawa, January 4, 1973.*

<sup>11</sup> *Hon. Charles MacNaughton, Ontario Proposals for Tax Reform in Canada* (Toronto: Department of Treasury and Economics, 1970).

<sup>12</sup> *Ontario's quantitative studies during the tax reform debate predicted this increased elasticity. See Staff Paper, "Tax Reform and Revenue Growth to 1980", Ontario Tax Studies 4* (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972).

*to: Department of Treasury and Economics,*

<sup>13</sup> *Hon. W. Darcy McKeough, Supplementary Report on Federal-Provincial Finance* (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, March 28, 1972) pp. 10-14.

<sup>14</sup> *Hon. Charles MacNaughton, "The Public and Economic Policy", Ontario Budget 1970* (Toronto: Department of Treasury and Economics, March 1970).

<sup>15</sup> *Hon. W. Darcy McKeough, Supplementary Report on Federal-Provincial Finance.*

<sup>16</sup> *Staff Paper, "Federal-Provincial Shared-Cost Programs in Ontario", Ontario Tax Studies 8* (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1972).



# Conservation of Historic Sites and Buildings in Ontario

Local Planning Policy Branch,  
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This article is concerned with the continued loss of what might be called the "architectural heritage" of Ontario. "Architectural heritage" is a general term and is intended to embrace not only individual buildings, or parts of such buildings, but also areas, districts and even complete communities which have aesthetic quality or historic association.

The preservation of sites and buildings, identified as being of value, is complex and includes a number of interrelated elements, any of which may predominate in a given situation. Particular elements of importance may be identified as:

- destruction of individual buildings;
- alteration or addition to the exterior of individual buildings;
- destruction or alteration of the interior of individual buildings;
- destruction or alteration of the immediate environment or setting of individual buildings;
- destruction or alteration of all, or any part of, the environment in an area, district or complete community.

The first three of these elements may be controlled by measures affecting the individual building, while the remaining two involve the identification of an area and consequent establishment of wider measures.

## Destruction of Individual Buildings

Destruction of individual buildings may be by deliberate demolition or by gradual deterioration. The first usually takes place either because a building is obsolete or inefficient, and cannot continue to serve a useful purpose, or because the site is economically under-utilized and occupied by the existing building. Occasionally a building may be destroyed simply to be replaced by something more "modern" or in approved corporate style. Some destruction occurs as the result of public action in re-opening roads, providing access to car parks or other "improvements".

Gradual deterioration may also be the result of the deliberate intention of an owner. Many older buildings on the fringe of downtown areas, for instance, are utilized by businesses in search of low cost accommodation. In economically disadvantaged parts of the province, however, slow decay is the reflection of the circumstances of owners who are unable to accept the considerable costs involved in maintaining older buildings.

## Alteration of Individual Buildings

The need for alteration or addition usually arises from some degree of obsolescence in the older building. The need to adapt for a new use frequently requires alteration, a common example being the insertion of shop fronts in former residential buildings. In some instances the owner may be inspired by the usually misguided desire to modernize. Many older buildings are capable of being extensively adapted and altered without harm, if the work is handled with skill and sensitivity. The problem of harmful alteration is mostly, therefore, the result of ignorance and lack of proper advice.

Alteration and damage to interior features is also too often the result of ignorance of their value and an inability to renovate or reconstruct with sufficient skill. It is, however, only rarely that such features would be considered of sufficient importance to warrant preservation.

## Environmental Damage

The final two elements of the problem result from both individual and community action on a number of levels. The first level involves major change in the physical structure of an area. This may occur as the result of deliberate action to achieve community planning objectives or because of economic or social pressures. The planning objectives may well be related to problems originating outside the area in question.

Structural change may include alteration of the street pattern, the relationship of building groups or the relationship of buildings in a number of ways. An obvious case is that of a building originally designed to provide the architectural focal point of a street which no longer exists.

The second level involves the introduction of inappropriate uses into (or removal of acceptable uses from) the area. From a purely land-use planning point of view, the newly introduced uses may be acceptable, but at the same time may also be aesthetically incompatible with existing buildings or may damage historic association. Such changes of use may be the result of deliberate policy but are more often brought about by economic and social forces. Many examples exist of residential neighbourhoods now altered to commercial or industrial use, sometimes with individual buildings of value remaining, although in a quite inappropriate setting. Examples of the loss of appropriate uses are provided by the many fine commercial streets in Ontario that are suffering decay because of the relocation of commercial activity to suburban plazas or malls.

At the third level the problem is one of architectural incompatibility arising from individual decisions to rebuild or alter buildings in an inappropriate manner. The buildings altered may not be of any great merit in themselves but by reason of their scale, materials or detailing, may provide a proper setting for others of value. Such individual decisions may also be damaging in an area which is architecturally valuable primarily as a result of consistency in its design elements.

The final level involves interference with any of the many elements which combine to form a satisfactory townscape. Among these may be included trees, street furniture, and treatment of horizontal surfaces.

## Background to Provincial Study

To counteract the types of problems described above, the last 10 years have seen increasing interest in and concern about the need for conservation of historic buildings in Ontario. This interest originated primarily at the municipal level when a number of municipalities, notably the City of Kingston, expressed a desire to have local legislation enacted which would enable them to apply architectural control over works carried out to buildings of historic value. This initiative was recognized in 1970 when the City of Kingston Act was passed by the Ontario Legislature, thus enabling the City to pass by-laws designating buildings or structures as being of historic or architectural value. Kingston's success sparked a desire on the part of other municipalities to obtain similar legislation.

While deciding to support Kingston's efforts to deal with its special, but not unique local problem, the Government of Ontario determined that detailed studies should be carried out to identify, on a province-wide basis, the problems of architectural and historic conservation and to recommend appropriate general enabling legislation.

## THE STUDY

The findings of the study, undertaken by the former Department of Municipal Affairs, were published as a Final Draft Report in April 1971. The Report was in two parts: the first part analyzed the historical background, the nature and extent of the problem, preservation techniques in other countries (U.S.A. and Europe), and existing legislation and programs elsewhere in Canada; the second part described a proposed program for the Province of Ontario based on conclusions drawn from the material contained in Part I.



The Final Draft Report concluded that the proposed program should:

- provide for the protection of both individual buildings and districts of historic or architectural importance;
- be integrated with the overall planning process;
- be the shared responsibility of provincial and municipal governments and should be designed to encourage private initiative.

Accordingly, the draft report was circulated to selected municipalities, historical societies and architectural conservation groups in Ontario, and to other jurisdictions in order to invite comments and criticisms of the proposals. The majority of replies indicated overwhelming support for the program; the result was a decision to proceed with the preparation of a Final Report. It is this Final Report that forms the basis for the following program and for legislation.

## THE PROGRAM

### *(i) Protection of the Individual Building*

It was recommended that the protection of individual buildings should be achieved through a designatory procedure which would require that upon designation, the buildings become subject to various protective measures. This procedure would be the shared responsibility of the provincial and municipal governments: the Minister responsible for the program could designate buildings which could be considered as being of provincial importance, and municipal councils could similarly designate, by by-law, buildings of local importance. It was suggested that the inventories being undertaken by the National Historic Sites Service and the Archives of Ontario be used as the basis for selection of buildings to be designated and expert advice should be sought to determine those buildings which are of provincial importance. Advice from local historical societies and architectural conservation groups should be sought for the selection of local buildings of merit.

The protective measures, if enacted by legislation, would require that an owner of a designated building, if he wishes to carry out alterations, additions, or demolition, make application to the respective authority (Minister or municipal council) for authorization of such works. It was recommended that, in the particular case of an application to demolish, the Minister or the municipal council should be authorized to prohibit the work for a period of not more than 180 days. During this period

negotiations should take place with the owner and appropriate agencies should be consulted to determine what steps might be taken to preserve the building. This could take the form of either a direct acquisition or the acquisition of an interest in the building, or the making of conditional grants and loans and payment of compensation. If no agreement can be reached during this period, demolition may proceed.

Appeal procedures have also been recommended whereby an owner may appeal to the Minister against conditions imposed on a conditional approval of works.

### *(ii) Historic Districts*

It was observed during the preparation of the Draft Report that an essential part of any conservation program involves the need to protect the environmental setting of areas, districts and complete communities of outstanding architectural and historic value. Similar needs have been recognized in conservation policies in force in both Europe and the United States and also in the Province of Quebec. The report, therefore, recommended that municipalities be enabled to employ special land-use zoning techniques through the designation of areas as "Historic Conservation Districts". To facilitate this, a municipality must, however, adopt appropriate policies into its official plan and define areas to which such policies might apply. Moreover, a historic district study should be undertaken to provide the basis for these policies — the study to illustrate graphically the manner in which environmental and historic features are to be preserved. It was further recommended that municipalities encourage public involvement in the definition of historic areas by obtaining the views of interested groups and private individuals.

The policies thus established would be enforced by the zoning of affected areas as "Historic Conservation District Zones". Consequently, an owner of any building within such a zone would be required to obtain the authorization of the relevant municipal council for any alterations, additions, demolition or change in use of a building, subject to similar procedures and decisions which might be made in respect to individually designated buildings.

### *(iii) Financial Assistance*

The report proposed that financial assistance should be forthcoming from the public sector in the form of grants and loans, and that the private sector should be encouraged to become involved in the conservation field, primarily through the establishment of "revolving" funds, based upon the successful American pattern.

In addition, it was recommended that owner-designated buildings be permitted, subject to appropriate official plan policies, to sell ex development rights as a means of realizing some financial return on the development potential of a site occupied by an historic building, thereby reducing the threat of redevelopment of such a site.

### *(iv) Administrative Functions*

As mentioned previously, it was proposed that the program should be approached as a shared responsibility of the provincial and municipal governments in Ontario.

At the provincial level, it is presently envisioned that the necessary legislation will be enacted in the form of a new act and amendments to the Planning Act will be required. The responsibility of administering the procedure in various aspects will therefore be closely allied both to other historical cultural activities and to planning matters. The latter are presently functions of the Ministry of Treasury, Economics and Intergovernmental Affairs, while the former are generally centralized within the Ministry of Colleges and Universities.

An example of an associated organization exists in The Ontario Heritage Foundation whose success in the preservation field has been outstanding to date. It is recommended that the Foundation should also be closely involved in the program.

All of the above might be assisted in their tasks, particularly in regard to the selection of provincially important buildings, by a "Provincial Historic Advisory Board" to be comprised of experts known in Ontario for their contribution to historic and architectural conservation.

The Historical and Museums Branch of the Ministry of Colleges and Universities would continue with responsibility for plaquing, publications and recording of buildings and the ongoing preparation of building inventories.

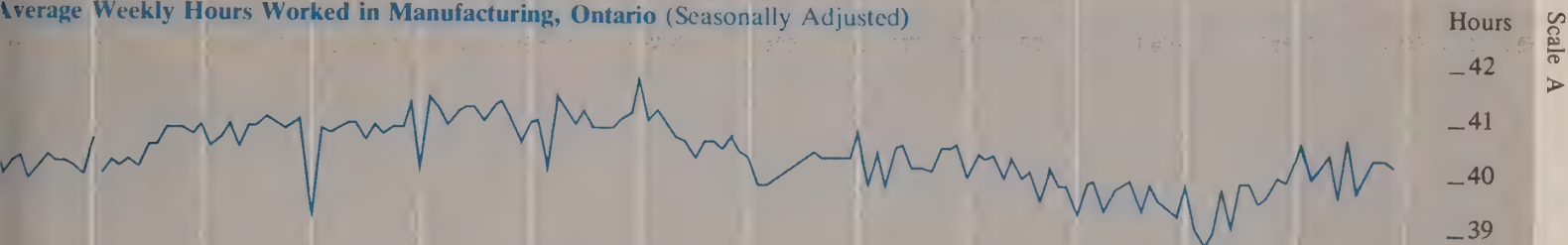
At the municipal level, administrative functions should rest with local municipalities or regional governments where appropriate. They could, in turn, be assisted by provincial authorities and/or a local "Historic Conservation Advisory Committee". Such a committee might legitimately comprise a cross-section of elected council members and co-opted citizen members, each with a demonstrated interest in the knowledge of, the history and architecture of the municipality. The committee could then allow for active citizen involvement in the conservation field while at the same time allowing certain council members exposure to the real problems of the preservation of our valuable historic and architectural heritage.



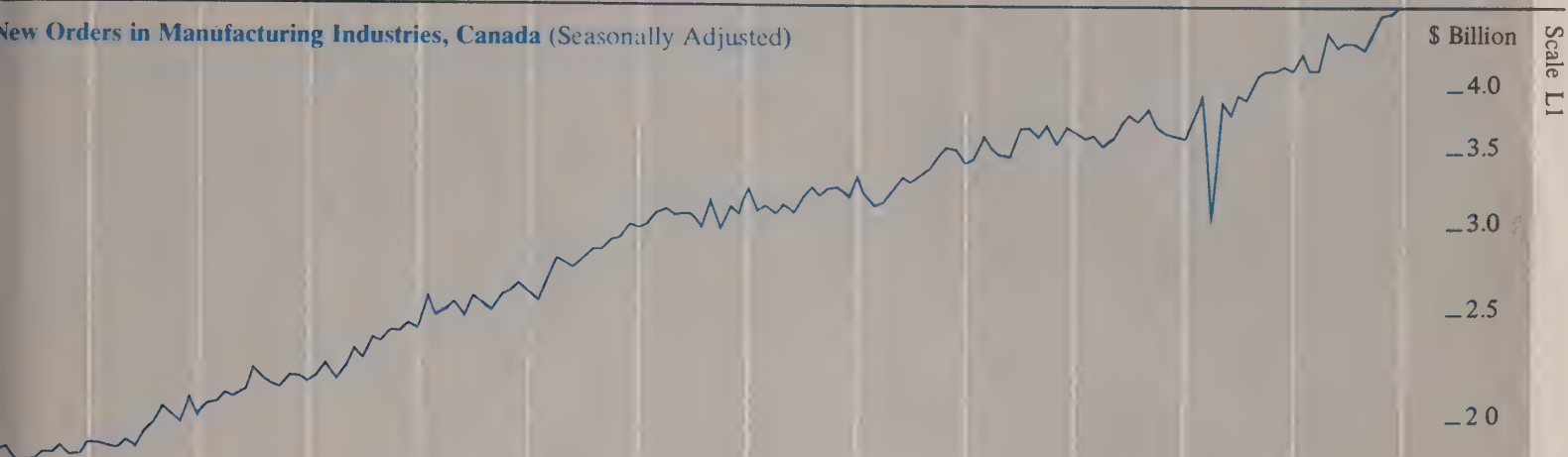
# Selected Economic Indicators

## Leading Indicators

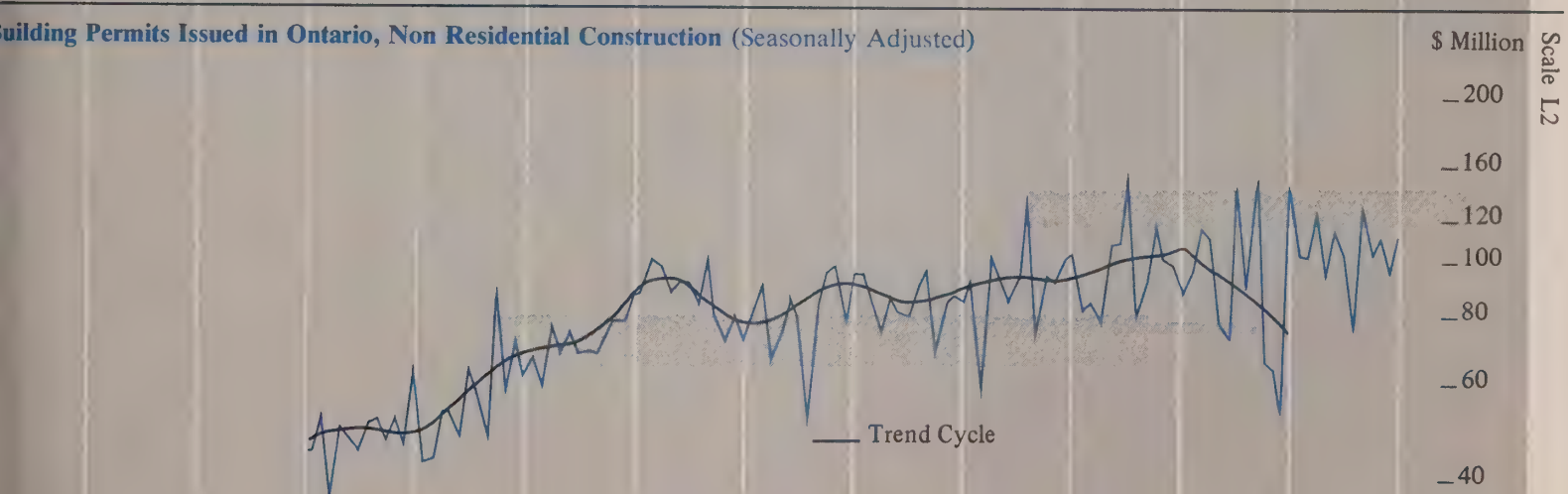
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



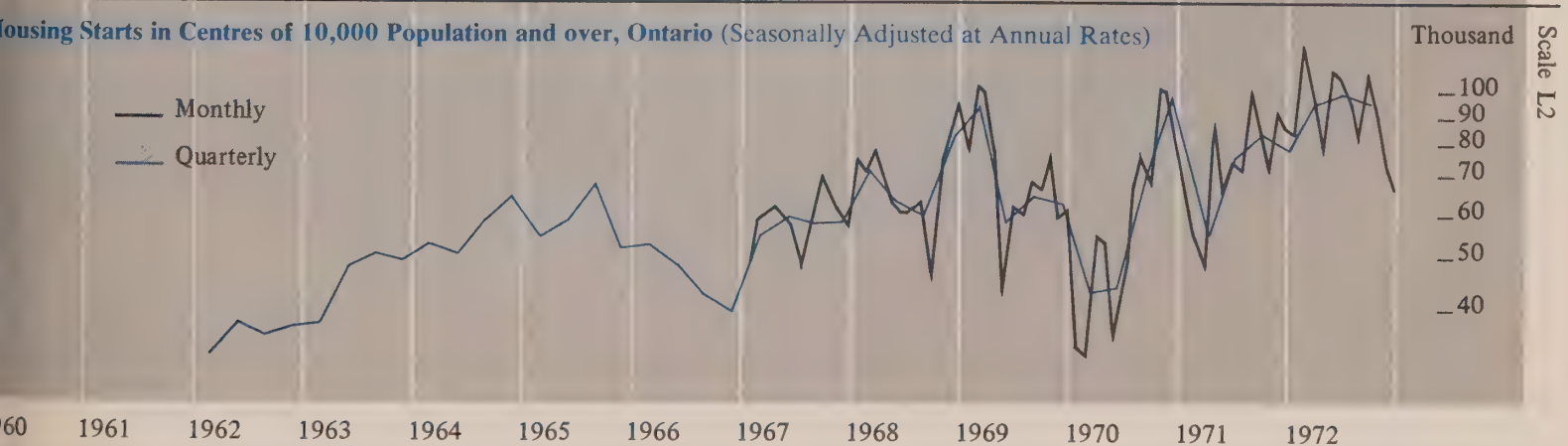
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)

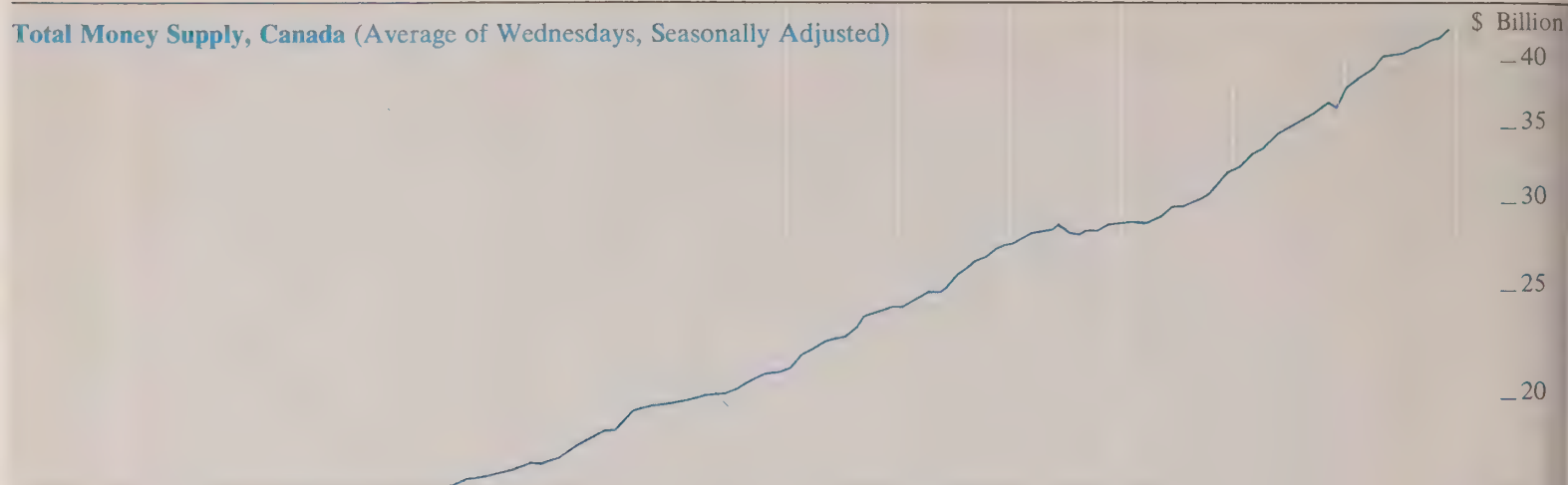


Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

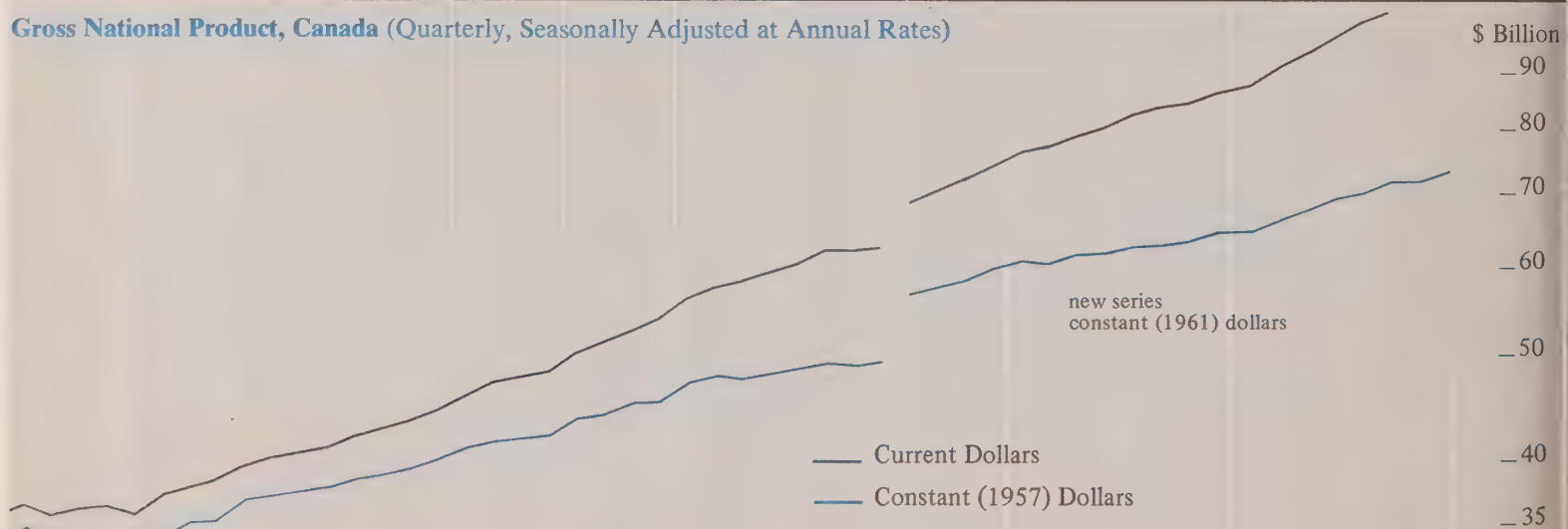


**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

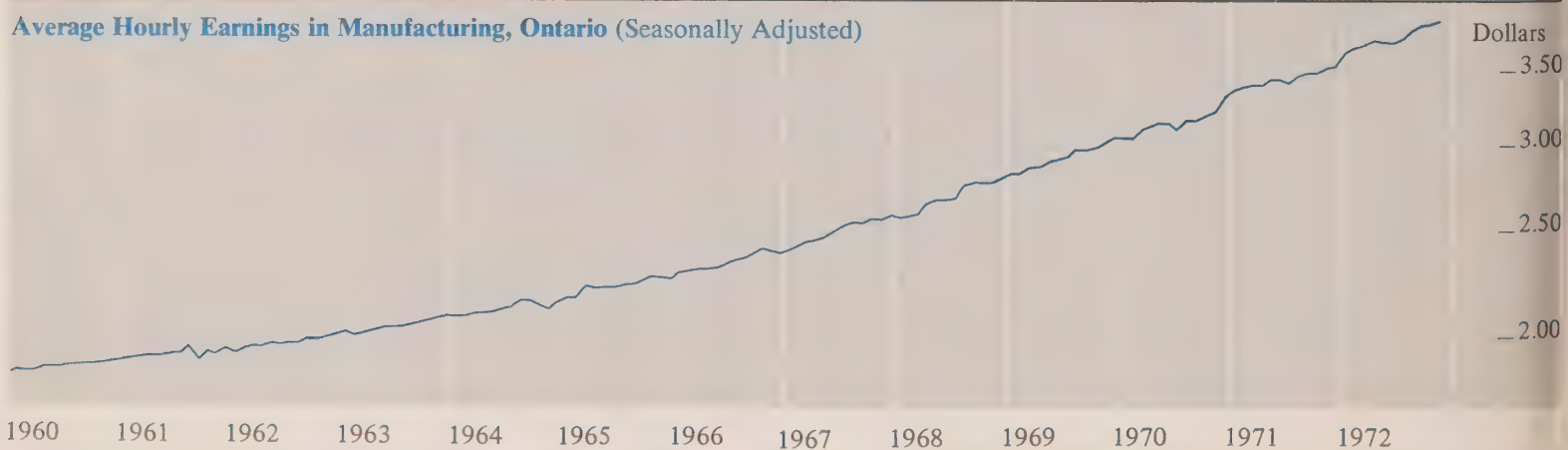


## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)





# Coincidental and Lagging Indicators



# Economic Indicators

Seasonally Adjusted

	1971		1972											
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
<b>Leading Indicators</b>														
Average Weekly Hours Worked in Manufacturing														
New Orders in Manufacturing Industries <sup>c</sup>														
Building Permits Issued in Ontario, Non-Residential Construction														
Urban Housing Starts (Annual Rate)														
Money Supply <sup>c</sup>														
T.S.E. Industrial Index <sup>u</sup>														
Business Failures <sup>u</sup>														
Business Failures — Liabilities <sup>u</sup>														
	40.0	40.4	40.7	40.1	40.2	40.5	39.7	40.8	39.8	40.1	40.4	40.4	40.2	40.5
\$ Million	4,267.0	4,216.1	4,368.1	4,213.4	4,234.7	4,563.0	4,439.8	4,488.0	4,459.5	4,402.2	4,561.6	4,745.0	4,760.4	4,836.0
\$ Million	53.1	139.6	103.4	102.5	123.2	95.1	114.7	104.7	76.7	128.2	104.7	110.4	96.7	112.4
Number	98,500	77,500	82,900	123,100	94,000	78,700	108,600	106,700	97,000	82,700	108,500	91,600	71,800	66,500
\$ Million	37,016	37,353	38,338	38,656	39,099	39,655	40,507	40,649	40,862	41,280	41,515	42,028	42,287	42,839
1956 = 100	166.2	181.6	197.3	203.6	197.7	200.0	204.0	199.7	204.8	214.1	210.8	203.2	215.4	221.6
Number	94	61	44	61	135	78	153	94	84	101	67	100	102	82
\$ Million	5.7	3.7	3.4	4.7	8.7	9.0	7.7	4.3	3.9	7.4	4.5	4.1	13.8	3.8
<b>Coincidental and Lagging Indicators</b>														
Gross National Product <sup>c</sup> (Annual Rate)														
\$ Million		96,596			98,992			101,964			103,728			107,056
Average Hourly Earnings in Manufacturing														
3-Month Treasury Bill Rate <sup>c,u</sup>														
Cheques Cashied in Clearing Centres <sup>l</sup>														
Retail Trade														
Labour Force														
Employed														
Unemployed														
Unemployed as % of Labour Force														
Wages and Salaries														
Index of Industrial Employment														
	3.52	3.53	3.62	3.66	3.66	3.70	3.69	3.68	3.73	3.79	3.82	3.84	3.86	3.87
Dollars	3.24	3.21	3.36	3.45	3.57	3.64	3.73	3.50	3.46	3.50	3.62	3.57	3.68	3.65
Per Cent	8,248	8,098	7,627	7,940	7,508	8,010	7,409	8,144	8,437	8,751	8,470	8,936	8,449	8,768
\$ Million	1,036	1,013	1,038	1,040	1,042	1,072	1,083	1,081	1,093	1,088	1,098	1,128	1,115	1,107
000's	3,314	3,318	3,349	3,338	3,366	3,352	3,371	3,370	3,377	3,395	3,408	3,408	3,416	3,441
000's	3,135	3,153	3,188	3,185	3,208	3,209	3,220	3,207	3,219	3,224	3,227	3,227	3,243	3,269
000's	179	165	161	153	158	143	151	163	158	171	181	181	173	172
Per Cent	5.4	5.0	4.8	4.6	4.7	4.3	4.5	4.8	4.7	5.0	5.3	5.3	5.1	5.0
\$ Million	1,809	1,827	1,853	1,857	1,875	1,894	1,893	1,922	1,923	1,933	1,952	1,973	1,997	2,027
1961 = 100	131.9	131.5	132.2	132.3	133.2	133.9	134.8	134.8	134.4	133.5	134.2	136.2	135.7	134.6
Index of Industrial Production <sup>c</sup>														
Total Manufacturing <sup>c</sup>														
Non-Durables <sup>c</sup>														
Durables <sup>c</sup>														
Mining <sup>c</sup>														
Electric Power and Gas Utilities <sup>c</sup>														
Primary Energy Demand (Annual Rate)														
Exports (including re-exports) <sup>c</sup>														
Imports <sup>c</sup>														
	187.5	187.8	189.4	189.5	191.1	195.1	192.8	194.0	194.0	192.6	195.4	200.4	202.3	203.3
1961 = 100	184.0	184.3	186.1	185.0	187.1	191.0	188.3	190.9	191.6	189.8	191.9	194.3	196.0	198.5
Total Manufacturing <sup>c</sup>	163.4	163.7	164.5	162.9	165.4	169.4	167.5	172.0	170.4	169.1	171.4	172.7	173.1	175.9
Non-Durables <sup>c</sup>	210.1	210.3	213.3	213.1	214.6	218.4	214.6	214.8	218.5	216.1	217.9	221.5	225.0	227.1
Durables <sup>c</sup>	190.2	190.6	192.2	194.9	193.3	200.8	197.2	189.3	185.3	185.0	192.8	210.9	212.7	206.7
Mining <sup>c</sup>	213.3	213.8	213.5	218.8	221.9	221.3	224.3	228.2	228.3	227.9	229.2	236.4	239.6	239.2
Electric Power and Gas Utilities <sup>c</sup>	70.26	68.83	70.19	72.37	72.63	72.07	71.74	72.90	73.58	73.16	74.64	76.15	76.56	75.43
Primary Energy Demand (Annual Rate)	1,507	1,508	1,485	1,580	1,551	1,559	1,675	1,750	1,486	1,600	1,569	1,859	1,982	1,826
Exports (including re-exports) <sup>c</sup>	1,387	1,362	1,496	1,416	1,517	1,525	1,538	1,514	1,532	1,603	1,531	1,667	1,671	1,707
Imports <sup>c</sup>														
<b>Unclassified Indicators</b>														
Foreign Exchange Reserves <sup>c,u</sup>														
Industrial Materials Price Index <sup>c,u</sup>														
Consumer Price Index <sup>c,u</sup>														
Toronto <sup>u</sup>														
Ottawa <sup>u</sup>														
Thunder Bay <sup>u</sup>														
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>														
	4,573	4,852	4,838	4,841	4,903	5,005	5,210	5,376	5,349	5,358	5,370	5,372	5,191	5,189
U.S. \$ Million	267.9	269.8	277.1	282.8	291.7	290.6	294.5	295.7	294.9	300.9	303.1	317.4	319.4	325.4
1935-39 = 100	135.4	136.3	136.7	137.3	137.4	138.2	138.3	138.5	140.2	141.3	141.8	142.0	142.3	143.3
1961 = 100	130.5	131.6	132.0	132.8	132.6	133.4	133.4	133.9	135.7	135.9	136.6	136.2	136.6	137.7
Toronto <sup>u</sup>	132.3	133.0	133.6	133.9	134.1	135.1	134.7	134.9	136.1	137.4	137.9	137.6	138.2	139.1
Ottawa <sup>u</sup>	104.9	105.4	105.8	106.3	106.3	107.0	107.1	106.6	107.2	108.4	108.9	108.5	109.1	109.5
Thunder Bay <sup>u</sup>														
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>														
	0.74	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70	0.70	0.70

<sup>u</sup>Not seasonally adjusted









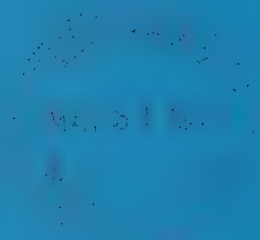


# Ontario Economic Review

March/April 1973  
Volume 11, Number 2

Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. John White,  
Minister of Treasury, Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



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## The Ontario Economy

### Payroll Taxation and Inflation

Ronald Holloway, *Economist*  
Taxation and Fiscal Policy Branch

### Government Reorganization and Treasury, Economics and Intergovernmental Affairs

Ministry of Treasury, Economics  
and Intergovernmental Affairs

A publication of the  
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Hon. John White  
*Minister of Treasury, Economics  
and Intergovernmental Affairs*

H. Ian Macdonald  
*Deputy Minister*

The *Ontario Economic Review* is prepared and edited bimonthly in the Economic Analysis Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs. The review presents articles of interest as well as current information on economic activity in Ontario. Signed articles reflect the opinions of their authors and do not necessarily represent the views of the Ministry.

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are available, free of charge, from  
the Ontario Government Bookstore,  
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#### About the Review

April 1 marked the first anniversary of the formation of the Ministry of Treasury, Economics and Intergovernmental Affairs.

During the first year of its life, the Ministry has undergone important structural changes. The announcement on March 1 by the Honourable John White on the completion of the second phase of the re-organization of the Ministry was a particularly significant milestone in its history.

The new Ministry was formed as the result of the restructuring of the Government of Ontario, underway since 1971. The feature article of the March/April edition of the *Ontario Economic Review* describes the structure, role and programs of the Ministry in the new government organization.

The short article by Mr. R.G. Holloway, of the Taxation and Fiscal Policy Branch, Ministry of Treasury, Economics and Intergovernmental Affairs, examines some of the uses of payroll taxation as a possible means of curbing inflation.

#### Indicator Charts, Pages 10-12

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators and are widely used to anticipate the short-term future course of the overall economy. The charts on pages 10, 11 and 12 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



## NADA AND ONTARIO —1972 IN PERSPECTIVE

Upturn in economic activity in Ontario and Canada, underway since 1971, continued throughout 1972. The total value of goods and services produced in Ontario rose by 10.8 per cent over 1971 to reach a level of \$42.1 billion. Growth of GNP was slightly lower than Ontario's GPP in 1972, advancing by 10.6 per cent to \$102.9 billion. After discounting price increases of 4.9 per cent, real growth in 1972 in Ontario and Canada amounted to 5.7 and 5.5 per cent respectively.

Data recently released by Statistics Canada indicate that while GNP growth was strong in 1972, advances throughout the year were uneven. GNP gains were slow in the first quarter, followed by a rapid rise in the second, a pause in the third, and a rapid surge in the fourth quarter. The unevenness in activity was due primarily to erratic merchandise exports which were hampered by strikes, unexpected declines in agricultural production and by uneven purchases of consumer durables.

The implicit price index rose 4.9 per cent for Canada as a whole, compared with 3.3 per cent in 1971 and 4.5 per cent in 1970. As in the rest of the world, price pressures were the greatest problem. Construction costs and export commodities also contributed substantially to widespread price gains.

While overall growth of the Ontario economy was similar to that of Canada in general, there were notable differences in the performance of certain sectors. For example, consumer expenditures in Ontario rose more than in the country as a whole, while exports, stimulated by large increases in natural gas, crude oil, lumber and wheat grew considerably more outside Ontario. Within the investment sector, residential construction activity was approximately the same throughout Canada, but in both machinery and equipment and non-residential construction, growth in Ontario was slower than in the rest of Canada. Also, government spending in Ontario and in the rest of Canada increased about the same pace. The net result of these activities was that the Ontario economy grew at a marginally faster rate than the Canadian economy in 1972.

In the important manufacturing sector, the long-awaited recovery finally arrived. The index of industrial production and the index of manufacturing advanced by 6.5 per cent and 6.1 per

cent respectively. Since over 50 per cent of Canada's manufacturing output originates in Ontario, the positive effect of this growth was stronger in Ontario than in any other province.

### The Ontario Labour Force in 1972

Employment in Ontario in 1972 grew by 140,000 or 4.5 per cent over 1971. Despite this rapid growth in employment, the labour force grew by 132,000 resulting in an average unemployment rate of 4.8 per cent for the year as a whole. This rate compares favourably with unemployment during 1971 of 5.2 per cent but was somewhat higher than the 4.3 per cent unemployment rate recorded in 1970.

Increased participation by women, and a large influx of workers in the 14-24 year range led to the unusually rapid labour force growth. In fact, many of the employment problems in Canada and Ontario have been the result of rapid labour force growth, and not lack of job opportunities as has often been suggested.

Of the 140,000 new jobs in 1972, 43,000 were in manufacturing, an increase of 5.1 per cent over the number of people employed in this important sector in 1971. This was a welcome occurrence as it was the first substantial increase in manufacturing employment since 1969. Despite this, jobs in the goods producing industries grew very little, as the number of jobs in agriculture and construction declined.

The largest increase, as in the previous two years, both in numbers and in percentage terms took place in the services sector. This sector now employs about 58 per cent of the work force as compared with 52 per cent in 1961. About 116,000 new jobs were created in the services sector, a gain of 6.3 per cent over 1971. Of all categories of services the number employed in trade and personal services grew most rapidly.

In comparison with other industrialized countries, Canada's labour force has grown faster than any other. In the past decade, Canada's work force grew by an average of 2.8 per cent annually, compared with 1.7 per cent in the U.S. and less than 1.0 per cent in West Germany, Sweden and the United Kingdom.

### Foreign Trade in 1972

Canada's merchandise trade surplus which stood at \$2.1 billion in 1971, dipped to a level of \$1.2 billion in 1972. The latest figure is just slightly below the \$1.3 billion surplus recorded in 1968. In the last four years, the surplus has

fluctuated from \$0.8 billion to \$2.9 billion.

During 1972, imports rose at a faster pace than exports; imports increased by \$3.1 billion or about 20 per cent while exports accounted for a gain of \$2.1 billion or 12 per cent. The value of exports, Statistics Canada reports, reached \$19,899 million in the year while imports registered a record high of \$18,701 million.

The growth of Canadian exports was irregular throughout the year, with sharp upturns in the second and final quarters, while the third quarter reported only moderate gains above the first quarter. Imports, on the other hand, showed gains in each quarter of 1972, the third quarter recording the smallest advance. Seasonally adjusted at annual rates, exports rose to a high of \$22.2 billion in the last quarter of the year, with imports rising to over \$20 billion.

The major boost to exports came from automotive products, and particularly those supplied to the U.S. Sales of automotive products to this market, mostly originating in Ontario, rose by almost \$500 million over the previous year. The same market also accounted for the bulk of a gain of \$350 million in lumber shipments and a \$280 million increase in crude oil and natural gas. Exports of aircraft and parts, and newsprint to the United States also showed gains in 1972, rising by \$100 million and \$50 million respectively.

Wheat sales in 1972 were substantially higher than a year earlier, increasing by nearly \$85 million, largely resulting from huge deliveries to the Soviet Union and the People's Republic of China. Shipments of copper ores were up \$50 million and those of whisky and pulp some \$20 million each. Marked declines in exports were noted in aluminum and iron ore, both down by about \$60 million with nickel falling by nearly \$30 million.

As in the case of exports, the major impetus to imports came from automotive products and accounted for 28 per cent of the total increase. While the rise in imports was spread across many goods, the increase of \$265 million in industrial machinery imports was significant. Food imports, including meat, fish, fruit and vegetables and sugar recorded a rise in value of nearly \$220 million with the value of crude oil imports increasing by some \$140 million. Moderate gains took place in imports of apparel, tractors, plastics, chemicals, non-ferrous metals and iron and steel products.

# Payroll Taxation and Inflation

Ronald Holloway, *Economist*  
Taxation & Fiscal Policy Branch

## Introduction

Inflationary pressures are increasingly evident in the developed economies. The restraints on prices and incomes which governments have applied have not been fully efficient, resulting in inequities, while their sudden relaxation or breakdown tends to renew the process of inflation at an accelerated rate. Where such measures have been successful in restraining price and wage increases, a complicated combination of unfilled job vacancies in the growth sectors of the economy and a relatively high rate of concealed unemployment in stagnating and declining industries tends to persist. Over the longer run, such structural rigidity itself has inflationary consequences. The alternative policy of dampening the expansion of demands tends, however, to create overt islands of unemployment. Payroll taxation is another possibility for restraining inflation.

## Basic Forms

A payroll tax may be imposed on an employer in relation to the number of employees, the pay of individual employees, or the gross amount of the payroll. Number-related taxes are frequently used to finance social security programs, usually as counterparts to employee contributions. While giving the appearance of relating costs to benefits, these taxes are unsatisfactory from other points of view. Their yields are relatively inelastic and the funding of contributions imposes an unwelcome rigidity on government expenditures. They also distort the labour mix by making low-skilled and part-time employees relatively expensive and distort the allocation of labour if applied selectively.

The appearance of a cost-benefit relationship is retained in those schemes which require employers to contribute to a fund in relation to tranches of pay of individual employees. These schemes often have lower income limits, to reduce distortion of the labour mix, as well as upper limits which are generally related to ceilings on benefits. The main disadvantage of such schemes is their complexity of administration. A tax on the gross payroll is simpler to operate, may be a contribution to general revenue, and may be applied either as a general tax or in special forms to further refined objectives. It is this group of taxes which is further considered.

## As an Addition to the Tax Burden

The first case to consider is where such a tax is imposed without a reduction in other business

taxes. If this happens, firms would be tempted to raise prices to maintain a constant rate of after-tax return. If all prices rise equally, the sale value of inventories and buildings, plant and machinery would also rise equally. This would raise the value of capital employed. To maintain the rate of return on capital employed with assets valued at replacement cost, the amount of the price rise would consequently have to exceed the amount of the tax.

Since the purchasing power of wages would also fall, the tax would transfer resources from wage earners (who would spend the greater part on consumption) to government which could use the tax as a short-term, deflationary measure (by reducing its borrowing from the banking system) or as a long-term deflationary measure by using the revenue to finance improved industrial efficiency. Even so, the immediate fall in the purchasing power of labour is likely to lead to widespread demands for increased wages, so completing the first round of an inflationary spiral at the cost of weakening the balance of payments position, pressing hard on those with fixed incomes, and possibly involving a loss of production through strikes.

There are, however, a number of improbabilities in this situation. First, in itself, the tax does nothing to increase the monetary supply. If there is no increase in the monetary supply, the same volume of production cannot be sold at higher prices and — in the short-run at least — firms are more likely to try to maximize sales than to try to maximize prices. The position is therefore quite different from the situation normally resulting from a general rise in wages (where governments have usually chosen to permit the expansion of the monetary supply to avoid unemployment and the increased monetary supply permits price increases without a reduction in output). This limitation is most evident for exports. If export prices rise, less is likely to be sold because the income available in other markets remains unchanged.

Besides this monetary limitation to price increases, there is the limitation arising from the availability (in both local and export markets) of foreign substitutes. Foreign competition may, in practice, be too imperfect in many sectors to act decisively in restraining price rises. But, where it does, it would also have the effect of tending to keep the value of inventories unchanged. This, in turn, would restrict an upward revaluation of capital employed. The availability of foreign plant and machinery at

payroll-tax-exclusive prices would also rest on revaluation. Foreign competitors might increase their prices and this would tend to support a revaluation. Higher distribution costs would not initially increase the cost of new capital equipment, but other costs may remain unchanged, particularly where prices have been fixed by contract. These factors favour the capital-intensive producer.

## As a Substitute

Since a firm of above-average efficiency would expect to have larger after-tax profits, if a payroll tax is substituted for income tax, it would be better able to absorb increases in costs due to factors unconnected with the tax (such as improvements in quality). In a competitive situation, the result should include reduced prices. However, where industries act collectively to set prices in order to maintain a satisfactory rate of profit for their least-efficient members, a payroll tax would lead to higher prices than those which would follow from income tax.

A substitution of a payroll tax, collected monthly, for corporate income tax, would reduce the necessity for government short-term borrowing (itself an inflationary pressure) and a factor in economic instability).

A possible objection against payroll tax is that it discriminates against the labour-intensive firm even when it is equally efficient. While this situation seems likely to be rare, a bias in favour of capital-intensive methods seems difficult to eliminate the uneconomic lapse in technological adaptation which appears to be associated with non-discriminatory treatment. However, a general tax on payrolls would have adverse short-term consequences for employment. In general statement, it is only in the long-run that greater capital intensity benefits employers through lower costs of increased output.

## Refinements

Refinements of the tax may improve the control of inflation. One possibility is to impose a surcharge on corporations which grant pay increases in excess of both productivity improvements and the rise in the cost of living. The formula adopted would most probably relate the increase in payroll to both the change in the number of employees and capital outlay. Another possibility is to vary the tax geographically, to reduce local excess demand for labour which tends to spill over into inflation nationally.



# Government Reorganization and Treasury, Economics and Intergovernmental Affairs

3

Ministry of Treasury, Economics and Intergovernmental Affairs

## INTRODUCTION

On March 1, the Ministry of Treasury, Economics and Intergovernmental Affairs completed the second phase of its part in the massive reorganization the Ontario Government has been undergoing since 1971.

This article shows how this one-year-old ministry fits into the new government organization. It also explains the composition and functions of the Ministry's two senior committees, outlines the Ministry's structure, and lists the activities of its branches.

## COMMITTEE ON GOVERNMENT PRODUCTIVITY

In December 1971, the Committee on Government Productivity made public its third interim report, containing recommendations for what Premier Davis termed 'significant reforms in government procedures and improvements in government performance.'

The committee put forward four reasons for proposed changes. (1) Ministers do not have sufficient time for policy-making. (2) The organization of the provincial government has become so large and complicated that it has become difficult to manage. (3) Because the cost of continuing existing services is outstripping available revenue, an improved priority-setting system is required. (4) The operation of individ-

ual government departments as separate and distinct entities is no longer appropriate to cope with issues that increasingly involve more than one department.

To meet the new organizational requirements of the 70's the committee made numerous proposals for a regrouping of programs and activities. The three most fundamental organizational proposals were:

- (1) the establishment of a new senior Cabinet committee — the Policy and Priorities Board. The Board's major responsibilities are to develop a strategic policy framework into which all government programs could fit, and to recommend government priorities to Cabinet;
- (2) the establishment of a new kind of minister, free of the responsibilities and burdens of the chief executive of a department. This is perhaps the most important change recommended by the COGP. Called provincial secretaries, these new ministers derive their influence from membership on the Policy and Priorities Board but do not have a line control over the activities of their colleagues running the ministries. Free of the administrative responsibilities of a portfolio, provincial secretaries have time to develop, evaluate,

and coordinate government policy among the various ministries in their policy field. Provincial secretaries are also in a position to devote considerably more time and thought to improving communication between government and citizens;

- (3) the grouping of programs and activities into fairly self-contained areas, known as policy fields. Three policy fields have been created: social development, resources development and justice. The primary objective is to improve policy coordination among related ministries and to ensure that potential conflicts (such as those that might arise between environmental considerations and economic growth) are recognized, thoroughly discussed, and to a significant extent, resolved at a sub-cabinet level. The major mechanism for achieving this is the policy field committee, chaired by a provincial secretary and composed of the ministers within each field.

There are a number of important functions and activities involving broad policy considerations which do not fit logically into any one of the three policy fields. To arrange these functions and activities, three new ministries have been formed: the Ministry of Revenue; the

Structure of Government in Ontario



Ministry of Government Services and the Ministry of Treasury, Economics and Intergovernmental affairs.

### MANDATE OF THE MINISTRY OF TREASURY, ECONOMICS AND INTERGOVERNMENTAL AFFAIRS

The restructuring of the Ontario government organization is intended to ensure that sound management practices will make the most effective use of resources. Achievement of this aim demands the development of integrated policy. Accordingly, the new organization has evolved with the establishment of the three policy fields

and the Policy and Priorities Board of Cabinet.

How does the new Ministry of Treasury, Economics and Intergovernmental Affairs contribute to this policy development? This question can be answered partly by outlining the responsibilities of this Ministry.

Basically, they are three-fold. First, the Ministry has direct responsibility for certain fundamental government functions: planning the Province's fiscal and economic policies, planning and implementing the Government's cash management and borrowing policies and developing provincial programs relating to municipal government and regional development. These

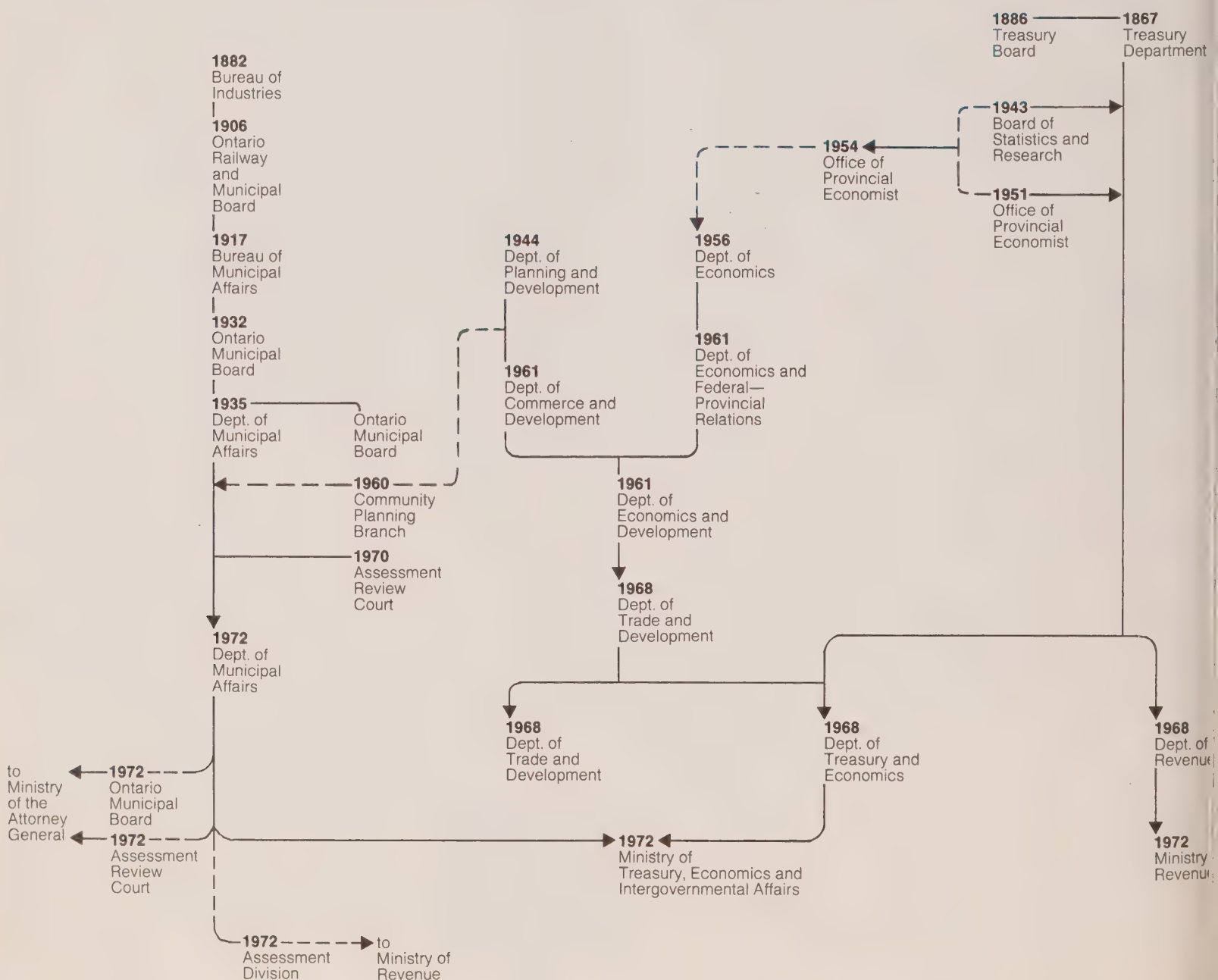
functions are central to government and are statutory responsibilities of the Treasurer.

Second, the Ministry has a responsibility provide policy advice to the Government whole through the Cabinet committee structure. This advice ranges over a wide variety matters that may touch the interests of all policy fields.

Third, the Ministry is responsible for coordinating Ontario's relationships with other levels of governments both inside and outside Canada.

The Ministry of Treasury, Economics and Intergovernmental Affairs combines many of

### Development of the Ministry of Treasury, Economics and Intergovernmental Affairs





ctions and personnel of two former departments — Municipal Affairs and Treasury and Economics. The responsibilities described here, however, represent more than a simple merger, since the new Ministry's responsibilities are more extensive than those of the two old departments:

The functions of the former Department of Treasury and Economics are integrated into the new Ministry and enlarged to encompass the new structure and decision-making process of the Government;

Most of the old Municipal Affairs functions are maintained but with a strong new emphasis. This Ministry now has a clear responsibility as the central coordinating agency for all the Government's relationships with local governments and with other levels of government. It is the Ministry's job to ensure that the Province's many relationships with local governments are consistent with the roles of the Province and municipalities.

These basic functions imply two methods by which the Ministry participates in the Government's decision-making process. The first is through the Minister in his capacity as Treasurer of Ontario, responsible for the budget and the trusteeship of the consolidated revenue fund, and in his capacity as the Minister responsible for municipal affairs. The second is through the provision of policy advice and commentary to other ministries, policy fields and Cabinet committees. In the new structure of government, this is expected to help integrate the work of ministries and agencies at many levels. It must ensure that policy proposals going to Cabinet committees are consistent with a policy on economic, financial, regional and intergovernmental matters.

The functions of the Ministry are both interrelated and government-wide in scope. For the first time, many matters traditionally handled by separate departments are coordinated within this one Ministry. There is an inherent relationship between provincial taxation, grants to municipalities, regional development, community planning, federal-provincial relations and provincial-municipal relations. All these now come under Treasury, Economics and Intergovernmental Affairs.

The Ministry's Fiscal Policy Division, to take a specific example, makes sure that provincial financial relations with local governments are developed consistently and are linked directly to the budget process. Similarly, provincial-municipal relations are coordinated with fed-

eral-provincial and inter-provincial relations, through the Ministry's Intergovernmental Affairs Secretariat. Consistency in these intergovernmental relationships has grown in importance as the federal government has shown increasing concern over urban and regional matters that were once left almost exclusively to the Province.

The new setup of the Ministry also recognizes that local government involves more than municipal councils and administrations; school boards and many other boards and commissions are included when provincial-municipal political and financial relationships are developed. This was much more difficult under the old structure.

Defining the lines of demarcation between provincial and municipal responsibilities is an important task of another of the Ministry's new divisions — the Urban and Regional Planning Division. This task has become especially urgent in matters of planning, since the Province, though increasingly active in regional planning, is anxious to leave local planning in the hands of municipal leaders. There are, of course, many other areas of activity in which both the Province and the municipalities are involved and the policies developed by Urban and Regional Planning will provide the guidelines for developing future provincial policies in this field.

The regional development program must be coordinated with the plans and programs of other ministries. As the COGP's Third Interim Report said:

"It is essential that those departments now involved in policy issues relating to regional development and regional government be effectively coordinated both for the formulation and implementation of policy."

As well as coordinating policies affecting the Province's relationships with federal and municipal governments, this Ministry will also coordinate Ontario's relationships with various international governments and agencies.

However, it is in the provincial-municipal area that the greatest changes in emphasis will occur. By developing a comprehensive policy on provincial-municipal relations, the Ministry will make it possible for the Government to make better decisions about other ministries' policy proposals affecting local governments.

In addition to policy development, this Ministry will be involved in many day-to-day relationships with local governments. These relationships will have to reflect, to a greater extent, the partnership concept espoused by the

Province. To some extent, this development should be seen as paralleling Ontario's approach to the federal government. In other words, the provincial government should be moving towards the kind of relationship with local governments that Ontario seeks with the federal government. This will involve greater freedom for local governments to establish their own priorities without constant interference and intervention by the Province. During this adjustment, the Provincial Municipal Liaison Committee, with representation from the municipal associations and with the Minister of Treasury, Economics and Intergovernmental Affairs as co-chairman, will serve as the central forum for negotiation between the Province and local governments.

## HOW TWO SENIOR COMMITTEES HANDLE POLICY AND ADMINISTRATION

As part of the new Ministry's structure, the Deputy Minister now has four key executives reporting to him — three Assistant Deputy Ministers and a General Manager of Administration. Their appointments have made it possible for the Deputy Minister to establish two senior committees — the Policy Committee and the Management Committee.

The Policy Committee, as the senior body for policy formulation in the Ministry, is the most important means of ensuring that the Ministry functions as a total organization. This committee meets at least twice weekly to determine and assign priorities and provides a continuous review of the entire range of policy issues related to the Ministry. Serving as a focal-point for the consolidation of ministry-wide views on internally developed policies, the committee makes policy recommendations to the Minister prior to their submission to the Policy and Priorities Board or Management Board. The committee also provides the Policy and Priorities Board, the Management Board and the Policy Fields with coordinated viewpoints and recommendations on policy issues initiated by the three policy fields or other ministries.

For the preparation of the Ministry's Annual Estimates, the Policy Committee identifies broad program priorities and makes recommendations for the allocation of resources both for these estimates and long-term expenditure planning.

The Policy Committee chairman is the Assistant Deputy Minister of Economic Policy and Intergovernmental Affairs, and membership includes the Deputy Minister, the other two Assistant Deputy Ministers and the General Manager of Administration. Staff support to

this committee is provided by the Policy Liaison and Program Analysis units. Policy Liaison personnel are in constant contact with developments in the policy fields and are able to inform the committee of emerging issues. Program Analysis personnel are involved in the Multi-Year Plan, annual estimates priorities, the planning and scheduling of programs and the administration of submissions to Policy and Priorities Board and Management Board.

The Management Committee, made up of representatives of the Assistant Deputy Ministers, provides coordination and advice to the General Manager on organizational, personnel and administrative matters in support of ministry operations and programs. Its objectives include: a continuous evaluation of the organizational efficiency and effectiveness within guidelines set by the Policy Committee, development and direction of the ministry manpower inventory and personnel development plan and coordination of the detailed preparation of the annual estimates. The Management Committee also makes sure that administrative processes and internal support procedures are efficient and fully responsive to the needs of the Ministry.

The Administrative Services Division, Legal Services and the Program Analysis units provide support services to this Committee on specific issues.

## **THE STRUCTURE AND FUNCTIONS OF THE MINISTRY OF TREASURY, ECONOMICS AND INTERGOVERNMENTAL AFFAIRS**

The Ministry of Treasury, Economics and Intergovernmental Affairs is composed of four broad programs:

- Economic Policy and Intergovernmental Affairs
- Finance
- Urban and Regional Affairs
- Administration

In turn, these four programs are made up of seven divisions, which are further divided into branches.

### **I — ECONOMIC POLICY AND INTER- GOVERNMENTAL AFFAIRS PROGRAM** This program consists of two divisions.

#### **OFFICE OF INTERGOVERNMENTAL AFFAIRS**

Through the Ministry, and with regular cooperation with the other divisions, the Office of

Intergovernmental Affairs provides intelligence and analysis to the Government on Ontario's international activities, its relationships with the Government of Canada, provincial governments and the municipalities. Its aim is to ensure a consistent and coherent intergovernmental policy framework. The division pursues its objectives through three groups.

#### **External Activities**

This group recommends and monitors a policy and operational framework for the development of Ontario's participation in international activities. This group also:

- ensures that Ontario's interests are taken into account by the Government of Canada in furthering its international policies and programs;
- assesses international treaties and agreements contemplated by the Government of Canada which affect Ontario.

#### **Federal-Provincial and Interprovincial Affairs Secretariat**

This secretariat advises on the effect of the policies and programs of both the federal and other provincial governments on Ontario and on the balance of jurisdictional responsibilities within the federation. The principle objective is to develop effective working relationships with other governments by:

- recommending objectives, and courses of action for Ontario in its relationships with the Government of Canada and other provinces;
- assessing the principal non-financial draft program agreements between the governments of Canada and Ontario, and those involving other provincial governments with Ontario;
- participating in the work of major Ontario inter-ministerial committees concerned with intergovernmental issues.

#### **Provincial-Municipal Affairs Secretariat**

The secretariat assesses and advises on provincial relations with the municipalities. Its main functions are to:

- manage the work of the Provincial-Municipal Liaison Committee to ensure its effective functioning;
- identify and analyze the impact on the provincial-municipal relationship of the policies and programs of Ontario ministries and agencies, the federal government, and developments in other provincial governments.

- evaluate the Government's responses to resolutions and briefs of its municipalities and their organizations.

#### **OFFICE OF ECONOMIC POLICY**

This division, which contains two branches, provides advice to the Ministry and to the Government of Ontario in the areas of socio-economic policy planning, economic analysis, economic intelligence, policy and support systems and strategic planning.

#### **Policy Planning Branch**

This branch was formed to develop (in cooperation with other governmental planning units) coordinated policies — which promote optimum economic performance and enhance social well-being in Ontario in the medium and long-term. It advises the Ministry and the Ontario Government on the aggregate and interrelated consequences of global, technological, economic and social trends and the probability and impact of these trends occurring in Ontario. It also provides the research support for the Premier's Joint Committee on Economic Policy. The basic functions of the branch are to:

- develop comprehensive policy planning frameworks in which the formation of Ontario's economic and social policies and priorities can be integrated, assessed and adapted to changing requirements;
- provide a mechanism for encouragement of other agencies within the Government to recognize the long-term implications of policies and provide advice for individuals and organizations within the Government that need assistance in formulating long-term policies.

#### **Economic Analysis Branch**

This branch provides an assessment of the current economic and social environment in Ontario and Canada in relation to the outside world. It interprets Ontario's economic and social policies in the light of these developments and advises upon and recommends alternative short-term policy approaches. Its main functions are to:

- monitor economic and social developments in Ontario, Canada and elsewhere;
- review the short-term economic and social consequences for Ontario and the resulting provincial policy implications of developments at other levels of government;
- where appropriate, propose alternative approaches and/or make recommendations.



consistent with the long-term policies adopted or considered by the Ontario Government;

respond to requests for an analysis and assessment of specific issues and problems referred to the Office of Economic Policy originating either within government or with external organizations.

## **CENTRAL STATISTICAL SERVICES**

Central Statistical Services is composed of four integrated units which collect, store and process statistical information as required by the Ministry and the Government. The agency administers matters concerning the administration of the Ontario Statistics Act, designs samples for statistical purposes and may conduct field surveys for client ministries.

At present a major project of the Statistical Secretariat within the agency is the development of the 1971 Census data access program including coordination and liaison with Statistics Canada as well as the establishment of a unit to service requests for 1971 Census data from Ontario Government ministries.

The Applied Statistical Research unit provides the Ministry and government with experience in advanced statistical methodology required to ensure uniformity in definitions, concepts and classifications which would enable integration and linkage of data.

The Socio-Economic Statistics section's activities provide for the collection, compilation, analysis and dissemination of statistical information relating to financial institutions, merchandizing and services, transportation and communications and other general economic and social activities in the Province.

The fourth unit manufacturing and primary industry statistics are collected annually by means of industry questionnaires mailed to all Ontario manufacturers.

## **FINANCE PROGRAM**

The program comprises two divisions.

### **FISCAL POLICY DIVISION**

This division, operating within an internally consistent framework of rigorous short and long-term budgetary planning, proposes, develops, integrates and monitors the Government's financial and financial policies towards stated social and economic objectives. Particular attention is paid to federal-provincial fiscal relations, the growth of the public sector in Ontario, tax policy, coordination of expenditure and financial actions, development of provincial fiscal policy and coordinated provincial-municipal fi-

nance and tax reform. The three branches in the division are:

#### **Intergovernmental Finance and Grants Policy Branch**

The main purpose of this branch is to provide an integrated approach to Ontario's intergovernmental fiscal relations, with particular attention to federal-provincial fiscal policies and tax and cost-sharing arrangements, provincial-municipal transfers and grants policies, and the budgetary implications of intergovernmental transfers and financial commitments. The branch is committed to:

- undertaking an immediate comprehensive review of existing ministry grants and recommending options for rationalization and improvement of the grant system and establishing a central mechanism for coordinating and centralizing these transfers;
- developing and recommending means of using transfers to reinforce such long-term objectives as increased municipal budgetary autonomy, flexibility and accountability.

#### **Taxation and Fiscal Policy Branch**

The responsibility of providing a central and integrated budget system, as well as coordinating the Government's budget, rests with this branch. Its main functions include:

- making recommendations on the use of provincial expenditure and financial instruments;
- developing overall tax policy options and monitoring the performance of the Ontario tax system;
- advising on Ontario's role in national tax reform;
- developing and coordinating provincial income redistribution policies which involve expenditure and tax actions.

#### **Municipal Finance Branch**

This branch was formed to ensure that the fiscal operations of the municipal sector run parallel to those of the provincial sector and that, wherever possible, local governments' independent financial capacities are strengthened. Its range of activities necessitate:

- developing, monitoring and modifying financial provisions for the operation of existing and restructured local governments;
- examining the financial and functional implications for the Province and local governments of federal action at the local level;

- developing a comprehensive municipal financial information system.

## **TREASURY DIVISION**

This division provides support to the Minister in his role as Treasurer and recommends policy relating to finance, debt management and the utilization of cash resources available to the Province. In addition to policy analysis, the setting of policy frameworks for sound financial management, and the reporting of budgetary and stewardship responsibilities, the Ministry presents a fiduciary service to government agencies, to the Legislature, the financial community and the public at large. Four branches make up the division. They are:

#### **Financial Information and Accounting Policy Branch**

The presentation of the financial operations and position of the Province is central to the activities of this branch. The branch has established a government-wide cohesive method for recording and reporting internally, in common terms, all transactions that ensure the validity and accuracy of financial information, provide benefits to other ministries and protect the assets of the Province.

The preparation of the Public Accounts of Ontario and other consolidated financial reports is undertaken by the branch in addition to the maintenance and control of the consolidated accounts of the Province. The development of accounting controls and design standards for accounting and financial information systems and coding classifications is one of the branch's main activities.

#### **Finance Management Branch**

The development and implementation of policy relating to finance, debt management and the utilization of cash resources available to the Province is the major function of this branch. Most activities of the Finance Management Branch are directed towards the management of an investment program which involves money market loans, temporary investments and the liquid reserve portfolio. Maintaining Ontario's credit standing, debt creation and service, internal as well as external sources of finance and the use of domestic and international capital markets are vital functions of the branch.

#### **Audit Standards Branch**

By guiding the ministries in the appreciation of systems of financial management control and company comptrollership functions, this branch seeks to bring about more effective use of resources.

The branch assists the ministries in developing and implementing corrective action as indicated by the post-audit reports of the Provincial Auditor and ensures that outstanding commitments, as conditions to post-audit, are resolved with internal control criteria.

#### **Securities Branch**

The operational support required by the Province to participate effectively and economically in the domestic and foreign capital markets is provided by the Securities Branch. In addition, the branch provides a fiduciary service to any ministry or agency requiring such a service and arranges for the complete maintenance for the Province's bond issues.

### **III – URBAN AND REGIONAL AFFAIRS PROGRAM**

This program is based on two divisions.

#### **URBAN AND REGIONAL PLANNING DIVISION**

The planning and presentation of policy options for the orderly and cohesive development of the regions of the Province forms the basic task of this division. Planning and organizational guidelines are instituted to promote more effective, responsive and responsible local government. Three branches have been created to fulfil this objective.

#### **Local Government Organization Branch**

The development of overall provincial policies relating to the functions and structure of local government is the prime concern of this branch. Refining and adopting these policies to satisfy local needs and aspirations is also undertaken.

Additional responsibilities of the branch include constant reviewing of all legislation affecting the municipalities and the development of policy for such matters as the role and organization of municipal councils, electoral processes, the role and suitability of boards and commissions and resident involvement in the political process.

#### **Regional Planning Branch**

The main objective of this branch is to design and coordinate the implementation of regional plans to achieve optimal economic and social potential for each region of the Province. The branch provides a framework within which development proposals can be interrelated and comprehensive plans for each region can be developed. Implementation of the regional plans is monitored and modified to reflect changes in economic and social conditions.

#### **Local Planning Policy Branch**

The overall aim of this branch is to develop planning policies to provide an optimal planned physical environment for local government or systems of local services and to secure the co-operation of provincial program delivery agencies to this end.

This branch is called upon to conduct special planning projects and studies, to develop general planning standards and to develop plans for such activities as urban renewal and subdivisions.

#### **LOCAL GOVERNMENT SERVICES DIVISION**

This division was formed to encourage and assist local government in effectively and efficiently achieving a community environment whereby local needs and aspirations, consistent with provincial goals and objectives may be satisfied. The division is based on three branches.

#### **Advisory Services Branch**

The provision of advice and assistance to members and staffs of municipalities, local boards, commissions and to the general public on all matters of concern to local government is the basic task of the Advisory Services Branch.

The branch recommends the use by local government of effective organizational and management practices and techniques and assists local government in taking advantage of the many provincial and federal programs available.

#### **Plans Administration Branch**

The main function of this branch is to advise and inform municipalities, private developers, industry, the public and other ministries on such matters as official plans, subdivisions, zoning, etc. The branch has the overall responsibility of ensuring that local government programs and community development projects are consistent with provincial policy.

#### **Subsidies Branch**

The administration and payment of all grants, subsidies and loans to the municipalities is undertaken by the Subsidies Branch. In addition, the branch is responsible for the administration of employment incentives and taxation on provincial property.

#### **NORTH PICKERING COMMUNITY PROJECT**

Responsibility for planning the development of the new community of North Pickering has been delegated to an interdisciplinary team

attached to the Urban and Regional Affairs Program.

The key members of the team are the coordinators drawn from both the public and private sectors and representing such disciplines as sociology, land-use planning, environmental planning, architecture, transportation and services engineering, economics and administration. The primary responsibilities of the team include:

- property acquisition;
- the preparation and implementation of the Plan for Development for the North Pickering Community;
- providing the coordination between all participants in the planning process. These include provincial ministries, municipal governments, the federal government, public and private agencies, consultants and the public at large.

### **IV – ADMINISTRATION PROGRAM**

This program consists of one division. In addition, six agencies, providing a variety of services to the Ministry, report directly to the General Manager of the Program.

#### **ADMINISTRATION SERVICES DIVISION**

The range of support services provided by this division include the acquisition of goods and services, accounting and personnel administration. Three branches have been created.

#### **Offices Services Branch**

The aim of this branch is to provide the Ministry with goods and services of a quality consistent with the needs of the operating program. The branch is committed to implementing an effective system of inventory control, reducing the cost of in-house printing and reducing duplication of departmental records.

#### **Accounts Branch**

The responsibility for ensuring that operational personnel receive all necessary accounting support belongs to the Accounts Branch. Its various activities are concerned with the processing for payment of all accounts, subsidies, grants, travelling expenses, etc., and the maintenance of financial records of the Ministry's revenues and expenditures.

#### **Personnel Administration Branch**

This branch is responsible for a full range of personnel services, including recruitment, training



development, staff relations, position administration and employee counselling.

In addition to administrative services, a number of other supportive units report to the General Manager. These include; Program Analysis, Organization Development, Systems and Programming, Legal Services, Library Services and Information Services.

#### Program Analysis

The prime responsibility of Program Analysis is to assist management in the planning required to achieve ministry objectives, in the efficient and effective allocation and utilization of resources and in the evaluation of program performance. This unit also coordinates the planning, programming and budgeting process throughout the Ministry, the Multi-Year Plan and the Annual Estimates.

#### Organization Development

This unit was formed to create and maintain a

coordinated organization and development program to assist management in the continuing development of the Ministry to meet changing requirements.

#### Systems and Programming

Computerized government cheque-writing systems have been developed by this branch, which also handles automated storage and retrieval of government financial information. The branch also undertakes computerized processing and retrieval of industrial statistics, analysis of income tax schemes through computer simulation and the development of methods and procedures for administrative systems.

#### Legal Services

In addition to providing legal service on all aspects of law pertinent to the Ministry, this unit prepares legislation, regulations, orders-in-

council, minister's orders, contracts and other agreements and represents the Ministry before various boards and tribunals.

#### Library Services

This unit maintains a reference centre for ministry staff, other government departments and municipal officials. Its collection contains approximately 50,000 books and reports, 500 periodical titles, clippings, special files and indexes on finance, economics, town planning, federal and provincial relations, regional planning and development and municipal government.

#### Information Services

Communications policy advice, editorial-writing, media relations, graphic arts and distribution services are provided by Information Services. This unit also handles public inquiries about the Ministry's activities.

### Ministry of Treasury, Economics and Intergovernmental Affairs

Minister  
Honourable John White

Parliamentary Assistants

Donald Irvine, MPP  
Arthur Meen, MPP

Deputy Minister  
John Macdonald

Ministry Central Office - S. I. Ker

Policy Liaison - A. G. Careless

Economic Policy & Intergovernmental Affairs  
S. Stevenson

Central Statistical Services  
M. Schnick

Office of Governmental Services  
S. Greathed

Financial Planning  
To be filled

Financial Planning  
S. Posen

Financial Planning  
To be filled

1, 1973

Structure to be determined after further study.

Finance  
T. M. Russell

\*Debentures Corporation

Office of Economic Policy  
To be filled

Taxation & Fiscal Policy  
To be filled

Municipal Finance  
A. W. Reeve

Intergovernmental Finance & Grants Policy  
H. Ploeger

Treasury Division  
G. McIntyre

Financial Information & Accounting Policy  
A. W. Nethery

Finance Management  
D. S. McColl

Securities  
L. D. Gagen

Audit Standards  
D. J. Morgan

Urban & Regional Affairs  
C. P. Honey

\*Policy & Research  
To be filled  
North Pickering Project  
J. L. Forster

Urban & Regional Planning Division  
E. M. Fleming

Regional Planning  
S. J. Clasky

Local Government Organization  
R. M. Farrow

Local Planning Policy  
G. K. Bain

Local Government Services Division  
D. F. Taylor

Advisory Services  
E. A. Gomme

Plans Administration  
G. M. Farrow

Subsidies  
M. D. Trewin

Regional Offices

Administration  
G. G. Bell

Administration Services Division  
W. G. Ritchie

Accounts  
R. G. Ferguson

Office Services  
A. G. Marshall

Personnel Administration  
R. A. Quirk

Program Analysis  
A. S. Bronskill

Organization Development  
To be filled

\*Systems & Programming  
W. P. Duffey

Legal Services  
S. Wychowanec

Library Services  
B. Weatherhead

Information Services  
To be filled

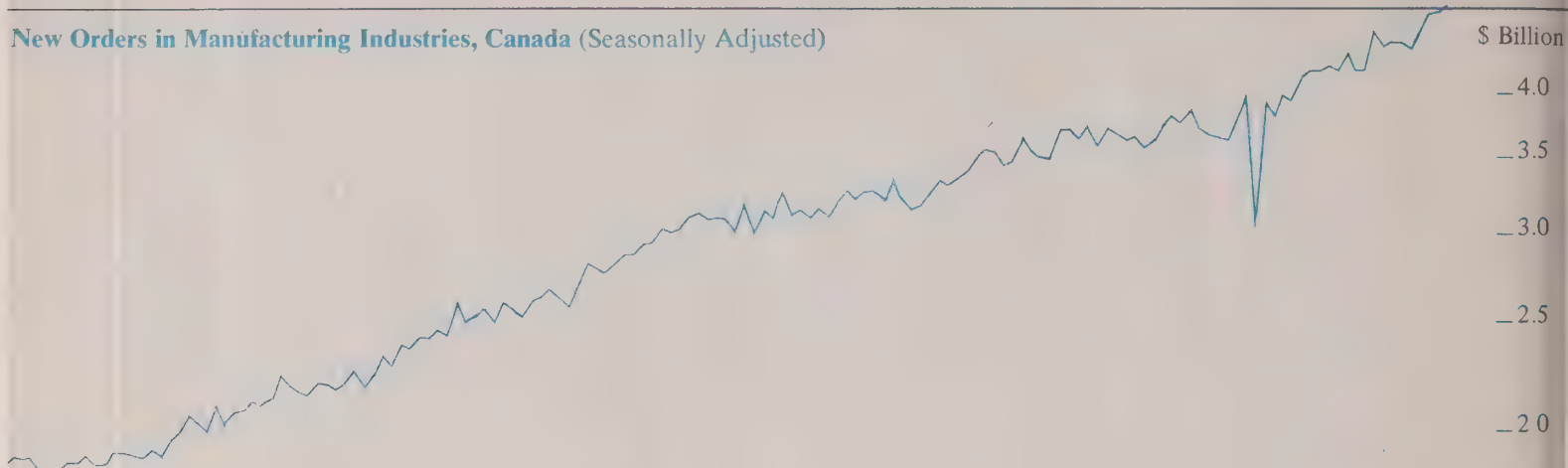
# Selected Economic Indicators

## Leading Indicators

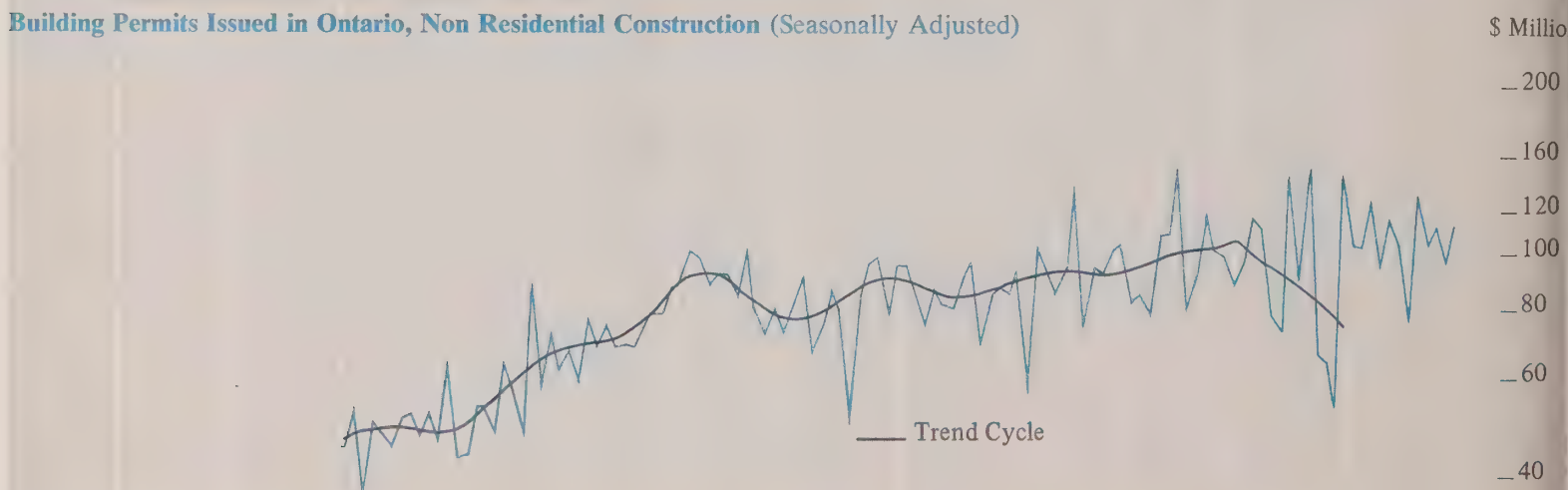
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



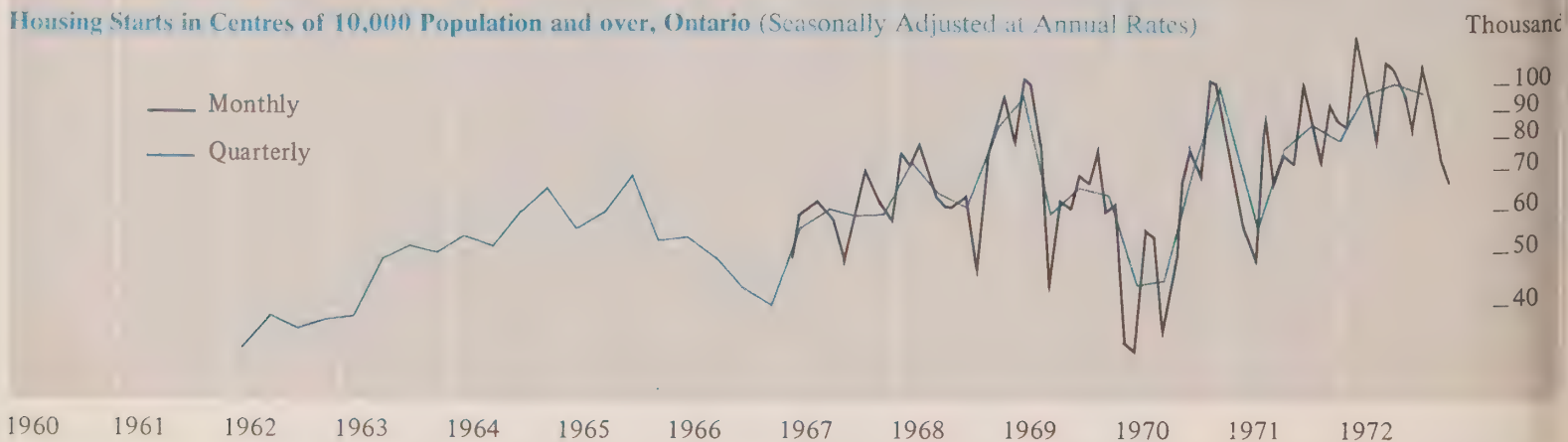
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)





## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

Scale L1  
\$ Billion  
\_ 40  
\_ 35  
\_ 30  
\_ 25  
\_ 20

**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Scale L2  
Index  
\_ 200  
\_ 180  
\_ 160  
\_ 140  
\_ 120  
\_ 100

## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

Scale L1  
\$ Billion  
\_ 90  
\_ 80  
\_ 70  
\_ 60  
\_ 50  
\_ 40  
\_ 35

— Current Dollars  
— Constant (1957) Dollars

new series  
constant (1961) dollars

**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

Scale L1  
Dollars  
\_ 3.50  
\_ 3.00  
\_ 2.50  
\_ 2.00

0 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972

# Coincidental and Lagging Indicators

**Average Yield of 3-Month Treasury Bills, Canada** (Last Wednesday of the Month, Not Seasonally Adjusted)



**Employment, Ontario** (Seasonally Adjusted)



**Unemployment Rate, Ontario** (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)



**Index of Motor Vehicle Production, Canada** (1961 = 100, Seasonally Adjusted)



1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972



	1971					1972													
	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.					
Leading Indicators																			
Average Weekly Hours Worked in Manufacturing	40.0	40.4	40.7	40.1	40.2	40.5	39.7	40.8	39.8	40.1	40.4	40.4	40.2	40.5					
New Orders in Manufacturing Industries <sup>c</sup>	4,267.0	4,216.1	4,368.1	4,213.4	4,234.7	4,563.0	4,439.8	4,488.0	4,459.5	4,402.2	4,561.6	4,745.0	4,760.4	4,836.0					
Building Permits Issued in Ontario, Non-Residential Construction	53.1	139.6	103.4	102.5	123.2	95.1	114.7	104.7	76.7	128.2	104.7	110.4	96.7	112.4					
Urban Housing Starts (Annual Rate)	98,500	77,500	82,900	123,100	94,000	78,700	108,600	106,700	97,000	82,700	108,500	91,600	71,800	66,500					
Money Supply <sup>c</sup>	37,016	37,353	38,338	38,656	39,099	39,655	40,507	40,649	40,862	41,280	41,515	42,028	42,287	42,839					
T.S.E. Industrial Index <sup>u</sup>	166.2	181.6	197.3	203.6	197.7	200.0	204.0	199.7	204.8	214.1	210.8	203.2	215.4	221.6					
Business Failures <sup>u</sup>	94	61	44	61	135	78	153	94	84	101	67	100	102	82					
Business Failures — Liabilities <sup>u</sup>	5.7	3.7	3.4	4.7	8.7	9.0	7.7	4.3	3.9	7.4	4.5	4.1	13.8	3.8					
Coincidental and Lagging Indicators																			
Gross National Product <sup>c</sup> (Annual Rate)		96,596			98,992			101,964			103,728			107,056					
Average Hourly Earnings in Manufacturing																			
3-Month Treasury Bill Rate <sup>c,u</sup>	3.52	3.53	3.62	3.66	3.66	3.70	3.69	3.68	3.73	3.79	3.82	3.84	3.86	3.87					
Cheques Cashed in Clearing Centres <sup>l</sup>	3.24	3.21	3.36	3.45	3.57	3.64	3.73	3.50	3.46	3.50	3.62	3.57	3.68	3.65					
Retail Trade	8,248	8,098	7,627	7,940	7,508	8,010	7,409	8,144	8,437	8,751	8,470	8,936	8,449	8,768					
Labour Force	1,036	1,013	1,038	1,040	1,042	1,072	1,083	1,081	1,093	1,088	1,098	1,128	1,115	1,107					
Employed	3,314	3,318	3,349	3,338	3,366	3,352	3,371	3,370	3,377	3,395	3,408	3,408	3,416	3,441					
Unemployed	3,135	3,153	3,188	3,185	3,208	3,209	3,220	3,207	3,219	3,224	3,227	3,227	3,243	3,269					
Unemployed as % of Labour Force	179	165	161	153	158	143	151	163	158	171	181	181	173	172					
Wages and Salaries	5.4	5.0	4.8	4.6	4.7	4.3	4.5	4.8	4.7	5.0	5.3	5.3	5.1	5.0					
Index of Industrial Employment	1,809	1,827	1,853	1,857	1,875	1,894	1,893	1,922	1,923	1,933	1,952	1,973	1,997	2,027					
	131.9	131.5	132.2	132.3	133.2	133.9	134.8	134.8	134.4	133.5	134.2	136.2	135.7	134.6					
Index of Industrial Production <sup>c</sup>																			
Total Manufacturing <sup>c</sup>	187.5	187.8	189.4	189.5	191.1	195.1	192.8	194.0	194.0	192.6	195.4	200.4	202.3	203.3					
Non-Durables <sup>c</sup>	184.0	184.3	186.1	185.0	187.1	191.0	188.3	190.9	191.6	189.8	191.9	194.3	196.0	198.5					
Durables <sup>c</sup>	163.4	163.7	164.5	162.9	165.4	169.4	167.5	172.0	170.4	169.1	171.4	172.7	173.1	175.9					
Mining <sup>c</sup>	210.1	210.3	213.3	213.1	214.6	218.4	214.6	214.8	218.5	216.1	217.9	221.5	225.0	227.1					
Electric Power and Gas Utilities <sup>c</sup>	190.2	190.6	192.2	194.9	193.3	200.8	197.2	189.3	185.3	185.0	192.8	210.9	212.7	206.7					
Primary Energy Demand (Annual Rate)	213.3	213.8	213.5	218.8	221.9	221.3	224.3	228.2	228.3	227.9	229.2	236.4	239.6	239.2					
Exports (including re-exports) <sup>c</sup>	70.26	68.83	70.19	72.37	72.63	72.07	71.74	72.90	73.58	73.16	74.64	76.15	76.56	75.43					
Imports <sup>c</sup>	1,507	1,508	1,485	1,580	1,551	1,559	1,675	1,750	1,486	1,600	1,569	1,859	1,982	1,826					
	1,387	1,362	1,496	1,416	1,517	1,525	1,538	1,514	1,532	1,603	1,531	1,667	1,671	1,707					
Unclassified Indicators																			
Foreign Exchange Reserves <sup>c,u</sup>	4,573	4,852	4,838	4,841	4,903	5,005	5,210	5,376	5,349	5,358	5,370	5,372	5,191	5,189					
Industrial Materials Price Index <sup>c,u</sup>	267.9	269.8	277.1	282.8	291.7	290.6	294.5	295.7	294.9	300.9	303.1	317.4	319.4	325.4					
Consumer Price Index <sup>c,u</sup>	135.4	136.3	136.7	137.3	137.4	138.2	138.3	138.5	140.2	141.3	141.8	142.0	142.3	143.3					
Toronto <sup>u</sup>	130.5	131.6	132.0	132.8	132.6	133.4	133.4	133.9	135.7	135.9	136.6	136.2	136.6	137.7					
Ottawa <sup>u</sup>	132.3	133.0	133.6	133.9	134.1	135.1	134.7	134.9	136.1	137.4	137.9	137.6	138.2	139.1					
Thunder Bay <sup>u</sup>	104.9	105.4	105.8	106.3	106.3	107.0	107.1	106.6	107.2	108.4	108.9	108.5	109.1	109.5					
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>	0.74	0.73	0.73	0.73	0.73	0.72	0.72	0.72	0.71	0.71	0.71	0.70	0.70	0.70					

<sup>c</sup>Statistics for Canada.

<sup>u</sup>Not seasonally adjusted.

<sup>l</sup>Ontario less Toronto.







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Ministry of Treasury, Economics and Intergovernmental Affairs

*Minister of Treasury, Economics and Intergovernmental Affairs*

**Hon. John White,**

Minister of Treasury, Economics and Intergovernmental Affairs

**H. Ian Macdonald, Deputy Minister**

*Deputy Minister of Treasury, Economics and Intergovernmental Affairs*



# Ontario Economic Review

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## New Directions in Family Allowances: A Review

Wendy A. Powell, *Economist*  
Taxation and Fiscal Policy Branch

## The Canadian Automotive Industry and The 1965 Agreement

N. Kristoffy, *Economist*  
Economic Analysis Branch

## Selected Economic Indicators

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### About the Review

The feature article for the May/June edition of the *Ontario Economic Review* examines the impact of the 1965 Canada-U.S. Automotive Agreement on the growth of the Canadian automotive industry. The Agreement has recently been brought to the fore in relation to developments in the energy field.

The export performance of the Canadian automotive industry has been outstanding, with the export share of industry production rising from 8 per cent in 1964 to 74 per cent in 1971. The effect on the automotive trade balance with the United States was to turn around a deficit of \$602 million in 1964 to a \$202 million surplus in 1970.

The article, which provides a historical perspective for the intergovernmental Agreement, was prepared by N. Kristoffy in the Economic Analysis Branch of the Ministry of Treasury, Economics and Intergovernmental Affairs. Considerable assistance in the drafting of the report was provided by Louise Steele of the Ministry of Industry and Tourism.

The article on family allowances, prepared by Wendy A. Powell in the Taxation and Fiscal Policy Branch, reviews some recent proposals by the federal government for a new program of benefits to replace the existing family and youth allowances.

Family allowances are examined as an income security device, and the new proposals are viewed in the light of previous reform proposals and the federal-provincial setting.

### Indicator Charts, Pages 9-11

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 9, 10 and 11 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



# New Directions in Family Allowances: A Review

Andy A. Powell, *Economist*  
Education and Fiscal Policy Branch

## INTRODUCTION

The federal government has proposed major changes in the Canadian family allowance system. In a working paper tabled in the House of Commons on April 18, proposals were advanced to replace the existing family and youth allowances with a new and substantially enhanced program which would be an essential element of income supplementation in Canada.<sup>1</sup>

The federal proposal contains three main features. Firstly, family allowance payments would be almost tripled from the current average payment level of \$7.21 to an average of \$20.00 per month. The average would be reviewed from time to time in light of changes in the Consumer Price Index. Secondly, allowances would be made taxable by including payments in the taxable income of the parent claiming the child as a dependent. Lastly, provinces would be given the opportunity to vary payment levels according to the age of the children and/or the number of children in the family provided that the average payment in each province remains at \$20 per month per child, and that payments do not fall below a certain minimum level.

Two interesting concepts are introduced in the federal proposal. Firstly, while the allowances would be universal, the taxation of allowances would introduce a degree of selectivity in the distribution of net benefits. Parents with no taxable income would retain the full amount of monthly payments while upper-income parents would return a significant portion of benefits through income taxation. Secondly, provision of provincial flexibility would allow provinces, for the first time, to determine the precise level of benefits to be paid under a federally-administered income security program. In effect, this provides a framework for provinces to alter federal allowances in accordance with their own social priorities.

The purpose of this article is to explore the background to the newly proposed family allowance plan with particular emphasis on the areas — the role of family allowances as an income security device, previous reform proposals, and the federal-provincial context.

## ROLE OF FAMILY ALLOWANCES

Family allowances are one method of providing regular income supplements to families. The first family allowance programs were introduced in Europe in the late 19th century, by employers, on a voluntary basis to assist employees in meeting the additional costs of

raising children. The period 1915 to 1930 witnessed a rapid increase in the number of family allowance programs and the consolidation of programs in major industries. Beginning in 1930, voluntary programs were gradually replaced with compulsory plans. At present, over 60 countries including all 27 European states, have family allowance programs operating on either a universal or employment-related basis.<sup>2</sup>

Family allowance plans vary in terms of the number of children covered, allowance rates, and financing methods. More than 80 per cent of the plans pay allowances to all children in the family; others commence payments with the second, third or even fourth child. Less than 10 per cent of the plans pay benefits on the basis of a means test. A significant number of plans use a progressive scale of benefits providing increasing payments for each additional child in the family. The remainder of programs provide equal benefits for each child with a few programs varying payments according to age. Universal programs are for the most part financed from general tax revenues while employment-related programs are generally financed through a payroll tax paid by employers.

While family allowance programs vary from country to country, they generally share the common purpose of promoting the well-being of children by attempting to reduce the gap between family incomes and needs. The underlying argument in support of family allowances is that no positive relationship exists between income and family need or size, with the result that the needs of children may not be met in large and lower-income families.

### Opposition to Family Allowances

Four main arguments have been cited against family allowance programs: "(1) Such allowances may tend to increase the birth rate, especially among poorer families; (2) the allowances may not be spent on children; (3) the allowances may tend to depress wages; and (4) a large portion of total family allowance payments would be to families who by no stretch of the imagination are poor".<sup>3</sup>

It is beyond the scope of this article to examine in detail the nature of these arguments. However, according to existing literature on the subject, there appears to be no statistical evidence to support the first argument.<sup>4</sup> With respect to the second argument, it is difficult to determine precisely how each family allowance dollar is spent. However, a number of surveys undertaken in Canada shortly after the program commenced did indicate that, on the whole, family allowances were being spent to improve

child welfare.<sup>5</sup> The third criticism may or may not be valid depending on the method of financing. In the Canadian program, which is financed out of general tax revenues, there is no evidence that allowances have had a depressing effect on wages. On the other hand, a program financed through an employer-payroll tax could conceivably inhibit wage increases. The validity of the fourth criticism is related to the objective of the program. If family allowances are intended to function strictly as an anti-poverty measure, then an income-related program is clearly more efficient than a demogrant. If however, the objective is to redistribute income towards children, then a demogrant program financed through the progressive taxation of personal incomes will, to some extent, redistribute income in favour of lower-income families with children.<sup>6</sup> Although the demogrant is less effective in redistributing income, it tends to be the more popular system for reasons related to ease of administration and the minimization of social stigma.

In any event, the federal government, in conjunction with the provinces, has chosen family allowances as the first step in the development of a new income supplement policy for Canada. The specific form of the proposal is very much related to the past debate over alternative plans, particularly the Family Income Security Plan.

## III — CANADIAN FAMILY ALLOWANCE POLICY

Universal family allowances were introduced in Canada in 1945 to meet a number of social and economic objectives. Firstly, they were intended to promote the well-being of children. Secondly, family allowances would compensate families for the inability of the wage structure to take family size into account. Family allowances would therefore have a direct impact on poverty by reducing the disparity between family income and family needs. Thirdly, it was claimed that the program would bolster income and employment during the post-war years by raising total consumption expenditures.<sup>7</sup> Lastly, it was held that a family allowance program financed through the progressive taxation of personal incomes would, to some extent, redistribute income from upper-income families to lower-income families and from richer provinces to poorer provinces.<sup>8</sup> Youth allowances were introduced in 1964 to encourage children to remain in school up to age 18.

In recent years, the existing family and youth allowance programs have been widely criticized. Since payment levels have remained



virtually unchanged since the inception of the program (\$6 a month per child under age 10, \$8 per month per child aged 10 to 15 and \$10 a month per child aged 16 to 17), while the cost of living has more than doubled, family allowances now have a limited impact in meeting the additional requirements of families with children.

### **Family Income Security Plan**

The federal white paper on income security published in November 1970, proposed to replace universal family allowances with a selective income-tested Family Income Security Plan (FISP).<sup>9</sup> The FISP was designed to concentrate family allowance payments among lower-income families and to eliminate payments to all families earning over \$10,000 annually.

The FISP proposal went through a number of modifications before legislation was introduced in September 1971. The final plan provided for maximum monthly payments of \$15 for children under age 12 and \$20 for children 12 to 17 years of age. Payments would be reduced by 33 cents per month per child for each \$100 of family income above designated floors. For example, a family with two children and \$7,000 income would receive \$202 annually, if income rose to \$9,000, benefits would decline to \$44 annually.<sup>10</sup>

The FISP had good arguments in its favour. It would have redirected available funds to families with children who were most in need. Given limited resources and a strict anti-poverty objective, this selective system of payments would have resulted in a more efficient use of available funds.

However, a number of strong arguments were raised in criticism of the FISP plan. For example, the Ontario Government expressed concern over the lack of integration of the FISP with the personal income tax system. Ontario illustrated that the combined marginal rate effects of the personal income tax rate schedule and the FISP recovery rates on families of different sizes and various income levels produced anomalies and inconsistencies, and in many cases, severe disincentives to increase earnings.<sup>11</sup>

Another criticism was that the FISP would be detrimental to the middle-income group by reducing or eliminating their present benefits.<sup>12</sup> It also was argued that the selective nature of the plan would distinguish low-income families from upper-income families, and thereby attach a stigma to receipt of benefits.<sup>13</sup> Moreover, administration of the scheme would be complex and expensive relative to the existing program.

In addition, it was pointed out that in many cases, family allowances paid to lower-income families would be less than the value to upper-income families of tax exemptions for dependent children. It was argued that the anti-poverty objective required more far-reaching measures than family allowances.<sup>14</sup>

Recommendations were made to the federal government by members of Parliament, by the Canada Council on Social Development, and by the Royal Commission on the Status of Women, that universal family allowances be maintained and the recovery of benefits to upper-income families be made through the personal income tax system, either through the normal marginal rate structure or through a special taxation scale permitting up to 100 per cent recovery.<sup>15</sup> The Canada Council on Social Development further recommended that children's exemptions be eliminated. The FISP Bill did not pass third reading in July 1972, and was not subsequently reintroduced.

### **The Castonguay — Nepveu Report**

Shortly after publication of the federal white paper on income security, *The Castonguay-Nepveu Report* was published in Quebec.<sup>16</sup> This report contained far-reaching proposals for a comprehensive and integrated income security plan. Like the federal white paper, the report laid strong emphasis on developing a new family allowance system.

*The Castonguay-Nepveu Report* recommended that family allowances cover a significant portion of the costs of child-rearing and that the remaining portion be covered by general social allowances. Family allowances would be paid on a universal basis and recovered from upper-income families by means of a separate and distinct taxation scale, incorporated in the income tax form, taking into account both family size and income level and permitting up to 100 per cent recovery of benefits.

While *The Castonguay-Nepveu Report* recommended selectivity within a universal program, Bill 286 tabled in the National Assembly in December 1971, proposed a selective family allowance program similar to the federal FISP proposal. The two plans differed mainly in that the Quebec plan would provide significantly greater benefits to large families. Thus, both Quebec and the federal government had made substantive proposals for reform of the family allowance system. This raised a number of important questions concerning federal-provincial jurisdiction and administration of family allowances.

## **IV — FEDERAL-PROVINCIAL RELATIONS**

The background of federal-provincial affairs in the area of family allowance policy is closely connected to the recent history of constitutional discussions between the federal government and the provinces. Over the past decade one of Quebec's social policy priorities has been in the area of family allowances. Quebec established its own Youth Allowance Program three years before a similar program was adopted in Canada. In 1967, it implemented a provincial family allowance system, supplementary to the federal program, which combined universal family allowance payments with the elimination of children's exemptions under the Quebec provincial income tax.

A major issue at the June 1971 Constitutional Conference of First Ministers in Victoria was jurisdiction in the field of social policy. Quebec unsuccessfully sought changes in the British North America Act which would have given the provinces primary responsibility for social policy. Among other things, this would have provided a basis for independent provincial family allowance policy.

After the Victoria Conference, with the constitutional question put aside, at least temporarily, Quebec sought to reach administrative and legislative agreement with the federal government on the specific issue of family allowances. In September 1971, Prime Minister Bourassa requested that the federal government include provisions in its FISP Bill to the effect that federal family allowances could be structured according to provincial family allowance legislation.<sup>17</sup> Subsequently, the federal government appeared to accept the principle involved in this suggestion. In March 1972, Prime Minister Trudeau proposed a formula for provincial participation in the design and financing of a FISP. The formula provided that a province could vary federal payments subject to minimum standards in return for financing at least 15 per cent of the cost of the Plan within the province.<sup>18</sup> When the FISP Bill failed to pass in July 1972, this offer became somewhat academic, but nevertheless, it set the stage for things to come.

In November 1972, the provincial Ministers of Welfare met in Victoria to discuss common problems in the field of income security and social services. At the conference, Quebec indicated that it had changed its family allowance proposal and was now advocating a system of universal, taxable allowances which would involve the integration of federal and provincial family and youth allowance programs.<sup>19</sup> In addition, Quebec indicated that it continued



ard family allowance policy as the first priority in income security reform, a view which was received sympathetically by other provincial ministers. The conference communiqué stressed the need for a federal-provincial review of the income security system. It cited family allowances as one area of immediate priority. In addition, it was recommended that provinces should have the administrative responsibility in this field.<sup>20</sup>

Shortly after this conference, the Minister of National Health and Welfare announced in January that the federal government intended to undertake, in conjunction with the provinces, a major review of the income security system.<sup>22</sup> He also announced that family allowances would be a fundamental part of this system and that the federal government was prepared to move quickly in this area after consultations with the provinces. Subsequently, the general plan was announced and discussed at a federal-provincial Meeting of Welfare Ministers in April 1973.

## CONCLUSION

The federal decision to initiate a major, new family allowance program at the outset of the

federal-provincial income security review is the cumulative result of a number of factors. Firstly, the existing family allowance system, basically unchanged for almost 30 years, was in need of reform. Secondly, the decision followed almost three years of extensive review of a number of alternative proposals for reforming the family allowance system, emanating primarily from the federal government and Quebec. The current proposal reflects a move away from more complex alternatives and the placing of a premium on simplicity and integration with the tax system.

Thirdly, it became clear that most, if not all provinces, strongly supported immediate action in the area of family allowances as a first major step towards income security reform. Fourthly, the proposal reflected a view that perhaps at last a mechanism had been found to progress towards an accord between the federal government and the provinces, particularly Quebec, in the field of social policy. The proposal appears to permit Ottawa to retain full command of its spending power, and the maintenance of national standards, while at the same time it creates a framework for the achievement of separate provincial social policy objectives. How well it accomplishes this dual objective re-

mains to be determined.

It is not without interest to note that there is a fifth important factor, hitherto unmentioned, underlying the federal proposal. That is, in the aftermath of tax reform the federal government had found itself with surplus revenue capacity primarily created by extremely high growth in personal and corporate income tax revenues.<sup>22</sup> This revenue growth placed the federal government in the position of being able to propose an \$800 million net enrichment in family allowances shortly after announcing personal income tax cuts with a total value of \$1.3 billion for 1973-74 and increased Old Age Security payments costing an additional \$290 million.<sup>23</sup>

The federal family allowance proposal is one initial aspect of a proposed major federal-provincial income security review which will encompass a wide range of income maintenance and social assistance programs. As the review moves to subsequent stages, it will become both more comprehensive and more difficult as new and possibly far-reaching program alternatives are developed. However, at this stage, it can be said that both the style and substance of the family allowance proposal have created a sound foundation for progress.

Hon. Marc Lalonde, Working Paper on Social Security in Canada (Ottawa: April 1973). The working paper outlines a conceptual framework for the federal-provincial review of income security and advances specific proposals related to family allowances and the Canada Pension Plan.

For Ontario's preliminary views on the overall process of income security reform see, Hon. Rene Brunelle, Perspectives on Income Security (Toronto: April 1973).

With respect to the Canada Pension Plan, Ontario published an extensive set of proposals. See Hon. John White and Hon. Rene Brunelle, Ontario Proposals for Amending the Canada Pension Plan (Toronto: April 1973).

For a full discussion of the evolution of family allowance programs, see, James C. Vadakin, Family Allowances (Miami: University of Miami Press, 1958), and by the same author, Children, Poverty, and Family Allowances (New York: Basic Books Inc. Publishers, 1968).

Christopher Green, Negative Taxes and the Poverty Problem (Washington: The Brookings Institution, 1967), p. 47.

See Vadakin, Children, Poverty, and Family Allowances, pp. 95-101.

Ibid., pp. 103-107.

For a discussion of who benefits from the Canadian Family Allowance Program and children's tax exemptions, see Lawrence A. Kelly, Family Allowances and the Tax System (Kingston: Industrial Relations Centre, Queen's University, 1971).

See also, Hon. John Yaremko, A Brief Prepared for the Special Senate Committee on Poverty (Toronto: May 1970), p. 28-34.

<sup>7</sup> Hon. John Munro, Income Security for Canadians (Ottawa: 1970), p. 44.

<sup>8</sup> A Review of the Role of the Department of National Health and Welfare in relation to Poverty (Ottawa: February 1970), p. 31, cited in Hon. John Yaremko, op. cit., p. 29.

<sup>9</sup> Hon. John Munro, p. 2.

<sup>10</sup> Assumes both children are under 12 years of age.

<sup>11</sup> Taxation and Fiscal Policy Branch, Department of Treasury and Economics, Preliminary Estimation of the Marginal Impact on Increased Earnings of the Three Federal Reform Programs - Personal Income Tax, Unemployment Insurance, and Family Income Security Plan (Toronto: July 1971).

For a discussion of the role of the personal income tax system in income security policy, see B. A. Smith, "Notes on Ontario Income Security Policy," Report of Proceedings of the Twenty-Fourth Tax Conference (Toronto: Canadian Tax Foundation, 1973).

<sup>12</sup> Canada, House of Commons Debates - June 27, 1972, pp. 3545; July 7, 1972, pp. 3872-3874, 3882-3884.

<sup>13</sup> Ibid., March 24, 1972, pp. 1140-1141; July 7, 1972, pp. 3876.

<sup>14</sup> For example, the Senate Committee on Poverty recommended abolition for family and youth allowances in favour of a comprehensive guaranteed annual income. See Poverty in Canada, A Report of the Special Senate Committee on Poverty (Ottawa: 1971), pp. xvi.

<sup>15</sup> Canada, House of Commons Debates, March 24, 1972, pp. 1142; July 6, 1972 pp. 3854; and July 7, 1972, pp. 3877. Report of the Royal Commission on the Status of Women in Canada (Ottawa: 1970), pp. 303. The Family Income Security Plan, Comments and Recommendations by the Canada Council on Social Development (Ottawa: 1971).

<sup>16</sup> Government of Quebec, Report of the Royal Commission of Inquiry on Health and Social Welfare (Quebec: 1971).

<sup>17</sup> Canada, House of Commons Debates, 3rd. Session, 28th. Parliament, Volume VIII, p. 7859.

<sup>18</sup> The terms of the formula were outlined by the Prime Minister of Canada in a letter to provincial premiers in March 1972.

<sup>19</sup> Hon. C. Castonguay, "Working Paper on Income Security", Interprovincial Conference of Ministers of Rehabilitation and Social Services, Victoria, November 27-28, 1972, p. 12. This proposal was quite similar to the original proposal contained in the Castonguay Report.

<sup>20</sup> Communiqué of the Ministers of Rehabilitation and Social Services, Victoria, B.C., November 28, 1973.

<sup>21</sup> Canada, House of Commons Debates, January 11, 1973, pp. 197-202.

<sup>22</sup> Hon. John White, Fiscal Policy Management and Tax Sharing Reform, Meeting of Ministers of Finance, Ottawa, January 1973 (Toronto: Ministry of Treasury, Economics and Intergovernmental Affairs, 1973).

<sup>23</sup> Hon. John N. Turner, Budget Speech (Ottawa: Department of Finance, February 19, 1973), pp. 10 and 16.



# The Canadian Automotive Industry and The 1965 Agreement

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## I — INTRODUCTION

The Canadian automotive industry, in the shadow of its much larger counterpart in the U.S., has a very turbulent history. After the industry's early beginnings at the turn of the century, Canada emerged in the 1920's as a major vehicle-producing country. During World War I and in the early 1920's, Canada held second place in world motor vehicle production. During these years Canada's automotive exports, which were destined primarily for the U.S. and the Commonwealth countries, amounted to 35 per cent of its production.

The automotive industry in Canada, essentially an Ontario industry, declined somewhat in the 1930's, but revived again during World War II when over 50 per cent of its production was exported. Up to this point the success of Canada's automotive industry was due basically to its ability to compete effectively in world markets. A basic shift in world automotive production followed World War II. As part of an effort to rebuild secondary industries which were destroyed during the war, nations seeking to establish their own export-oriented automotive industries instituted severe discriminatory actions against North American motor vehicle manufacturers.

### Post War Performance

By 1948, the export share of Canadian automotive production had dropped to 18 per cent, and by 1955 it had been further reduced to 4.1 per cent. Not only was the export share dwindling, but the domestic market was faced with increased competition from Europe. Despite a 17.5 per cent tariff, European imports made sizeable inroads into the North American automotive market; from 7 per cent in 1952, their share of this market had increased to 26 per cent in 1961.

In the late 1950's Canada was becoming increasingly anxious to expand its merchandise exports, as there was growing concern that Canada's population was too small to support large, efficient industries. Only by producing for much larger markets, it was believed, could Canada continue to maintain a rising standard of living for its rapidly growing labour force.

Against these developments, as well as the deterioration of the industry's competitiveness vis-a-vis European competition, the automotive industry was singled out by the Canadian Government for special investigation.

The degree of inefficiency in the Canadian automotive industry, as compared with that of its U.S. counterpart, prior to the Automotive Agreement, was reflected in several ways. Firstly, motor vehicle prices at the manufac-

turers' level in 1960 were over 10 per cent higher in Canada for exactly the same vehicle; secondly, employees were paid 30 per cent less in Canada; thirdly, and most important, the rate of return on invested capital was higher in the U.S. than in Canada. This inefficiency resulted in Canada's importing 162,000 more vehicles in 1960 than it produced. This imbalance meant a total deficit on the automotive account of \$528 million, with automotive products representing 10.5 per cent of all merchandise imports, but only 0.1 per cent of all merchandise exports.

### The Bladen Report

In 1960, the Canadian Government appointed Professor Dean Bladen as a one-man Royal Commission to examine the nature and prospects of the Canadian automotive industry. After an exhaustive investigation, Dr. Bladen made several important recommendations which were published in April 1961. Although only one of his recommendations was adopted, the Bladen Report was noteworthy for the concept of "extended content." This report laid the groundwork for the Automotive Agreement, which was to be signed four years later.

In 1961, the Canadian Government chose not to adopt the major proposals of the Bladen Report, but instead, in 1962, it introduced a "duty remission" plan, a move which became a most contentious issue in Canada — U.S. trade relations.

Realizing that a potential series of retaliations brought about by the duty remission plan would be wasteful and beneficial to no one, the U.S. and Canadian governments began negotiating in earnest for a solution to the potential trade crisis. These negotiations culminated in the signing of the historic Automotive Agreement in early 1965.

### The Automotive Agreement

President Johnson, in a letter to the President of the Senate and the Speaker of the House of Representatives, summed up the situation leading to the signing of the Agreement:

"The automotive producers of the United States and Canada make up a single great North American industry. The same kinds of cars, using the same parts, are produced on both sides of the border, in many instances in factories only a few miles apart. Over 90 per cent of the automobiles sold in Canada are assembled by firms owned in part or in whole by United States companies. The men and women who work in the plants on both sides of the border are members of the same international union.

Tariffs and other restrictions involving Canada — United States trade in automotive products have been the cause of significant inefficiency in this great industry. Canadian plants produce a great variety of cars, essentially identical with those made in far larger numbers in the United States. Because the Canadian market is relatively small, production runs have been short, and costs of prices have been high. High costs and prices in turn — supported by the tariff and other restrictions — have contributed to keep the market small.

Historically, Canada's share in North American automotive production has lagged far behind her share in automotive purchases. In 1963, in an attempt to increase share of the North American market, the Canadian government put into effect a plan involving the remission of tariffs, which was designed to stimulate automotive exports. A number of United States manufacturers, believing they would be injured by the plan, called upon this Government to impose countervailing duties. In all probability, such action would have invited retaliation. Both were faced by the prospect of a waste of time and money in a contest of stroke and counter stroke, harmful to both Canada and the United States and helpful to neither. Other broader good relations with our Canadian friends would have suffered serious strain. To avoid such a dismal outcome, our two governments began every effort to find a rational solution to the problem of the divided industry. The Automotive Products Agreement that the President and I signed in January is the result of our joint labours.

The agreement will benefit both countries. We will have avoided a serious commercial conflict. Canada will have achieved her objective of increasing her automotive production. United States manufacturers will be able to plan their production to make more efficient use of their plants, whether in Canada or the United States. They will save the price of the tariff, and, over the long run, we will benefit from the faster growth in the Canadian market which lower prices will make possible."

## II — PRODUCTIVITY IN THE CANADIAN AUTO INDUSTRY PRIOR TO 1965

One of the fundamental reasons for Canada entering into the Agreement with the U.S. was to increase the efficiency and productivity



omobile production in Canada. While no  
orous data on productivity are available,  
ere are some measures which indicate the  
Canadian industry's poor performance compared  
h that of the United States.

The first and most obvious difference, of  
ich all Canadians were aware, was the differ-  
ial in the price of cars. For most models,  
nufacturing list prices were over 8 per cent  
her in Canada than in the U.S. For some  
omobiles, such as the Buick Riviera, the  
ce differential was U.S. \$1,124 or 30.4 per  
nt. Secondly, Canadian-made automotive  
ports to the U.S. were \$96.8 million in 1964  
2.2 per cent of total Canadian exports to the  
ited States. Imports of automotive parts and  
icles, on the other hand, amounted to 13.5  
er cent of total imports from the United  
ates.

The third difference relates to the produc-  
ity per worker in the automotive industry. In  
63, the value added per Canadian automotive  
rker was only 69 per cent of that produced  
his U.S. counterpart; accordingly, Canadian  
ge rates averaged about 30 per cent below  
se for comparable jobs in the U.S.

#### — THE AUTOMOTIVE AGREEMENT

A formal Agreement was signed by President  
Johnson and Prime Minister Pearson on January  
16, 1965. The intergovernmental Agreement  
provided for the duty-free movement of most  
vehicles and original equipment parts. This  
included specialty vehicles, tires, tubes and re-  
placement parts. Provision was made for  
termination of the Agreement by either party  
thirteen months after notification of the intent  
to withdraw. It was also agreed that a joint  
review of the Agreement would be carried out  
in 1968.

The Agreement specified certain conditions  
for the duty-free movement across the border,  
different for the two countries.

#### The Sole U.S. Condition

The only safeguard provided for the protection  
of the U.S. industry was that automotive prod-  
ucts eligible for duty-free import have at least  
50 per cent Canadian content. This was aimed  
at preventing European firms, who had set up  
assembly facilities in Canada, from using  
Canada as a conduit for the duty-free entry of  
their automotive products into the United  
States.

#### Canadian Conditions

Canada's conditions were much more restrictive

and severe. Firstly, in contrast to the U.S.,  
which in effect permitted free entry of  
specified vehicles at all levels of the distribution  
chain — from manufacturer to retailer — Canada  
limited the right of duty-free importation to  
authorized manufacturers. To be included in  
this group, manufacturers needed to ensure that  
their production-to-sales ratio for each class of  
vehicle in Canada be at least .75, or that  
attained in 1964, whichever was greater. Gener-  
ally, this was intended to assure continued  
growth of the assembly operation in Canada, in  
line with the growth of North American vehicle  
sales in Canada. The main argument for insert-  
ing the ratio floor at .75 was to disqualify  
European or Japanese manufacturers who had  
or might set up manufacturing in Canada.

The second condition was a requirement  
that Canadian content in vehicles produced in  
Canada be maintained at least at the level  
achieved during the 1964 model year. This was  
a safeguard intended primarily for the benefit  
of Canadian parts producers who might be ad-  
versely affected in the initial stages of the  
Agreement. The formal Agreement thus pro-  
vided for limited free trade in motor vehicles  
and original equipment parts.

In addition to the Agreement conditions, the  
vehicle manufacturers were required to submit  
"letters of undertaking" to the Canadian Gov-  
ernment. In these letters, the companies gave  
written commitments to the Canadian Govern-  
ment which would guarantee a growth of  
Canadian value added in each year by an  
amount equal to: 60 per cent of growth of net  
sales for cars; 50 per cent of the growth in net  
sales of commercial vehicles sold in Canada;  
*plus* a total of \$260 million by 1968, divided as  
follows:

	\$Million <sup>1</sup>
General Motors	121.0
Ford	74.2
Chrysler	33.0
American	11.2
Others	20.6
Total	\$260.0

The Canadian Government would not sign  
the Agreement without the additional safe-  
guards in the letters of undertaking. It was fear-  
ful that the automotive companies would con-  
tinue to supply the Canadian market from the  
U.S., and still be able to meet the conditions of  
the intergovernmental Agreement. Canada  
wanted additional interim protection for its  
automotive industry until "it would become

efficient enough to motivate the U.S. auto  
manufacturers to give Canada its 'fair share' of  
the continental production."<sup>2</sup>

Since the conditions imposed by the United  
States favoured Canada above other nations,  
the automotive pact violated the GATT Agree-  
ment. A waiver was applied for by the United  
States, and subsequently granted on December  
20, 1965.

#### IV — THE ANTICIPATED RESULTS

##### Opposition to the Agreement

While the automotive pact was readily agreed to  
by the Canadian Government, many in the  
United States viewed the Agreement as having  
no beneficial effects to the United States; some  
vociferous opponents, like Senator Vance  
Hartke of Indiana, made the following  
comments:

"This started out as a rather humiliating  
thing for the United States to be faced with,  
in my opinion, but that is all right. We were  
threatened with unilateral action and then  
we went ahead and came in with this type of  
program (the Agreement). But assuming that  
we forgive and forget what they did, they  
are going to have a larger percentage of the  
market and in addition a larger percentage of  
that market will be Canadian value added.  
The net result in my opinion can mean only  
one thing, a reduction in exports from the  
United States to Canada, and a reduction in  
jobs in the United States, unless the differ-  
ence is made up by increased consumption  
beyond our normal growth pattern."<sup>3</sup>

The doubts held by many U.S. government  
officials about the economic consequences of  
the plan were reflected in the slow pace at  
which the U.S. Government proceeded with im-  
plementation of the plan. The Agreement was  
signed by Prime Minister Pearson and President  
Johnson on January 16, 1965, but it was not  
ratified by Congress and the Senate until  
October 21, 1965.

##### In Favour of the Agreement

Proponents in Canada and the U.S. argued that  
the plan was not designed to be one where one  
country would gain at the expense of another;  
the overall benefits would not total zero, but in  
fact both countries would gain. It was predicted  
that the net surplus of U.S. trade in automotive  
products with Canada would be slowly reduced  
from the 1964 figure of \$600 million.

### Price Differentials

It was also widely believed, though not emphasized, that price differentials between U.S.- and Canadian-made cars would be narrowed. It was anticipated that Canadian manufacturers would increase their rates of return on investment by taking advantage of increased economies of scale brought about through large-scale integration of the North American market.

### Economies of Scale

Because of economies of scale already present in the industry in the United States, dislocations there were expected to be minor. On the other hand, in Canada it was recognized that there would be some large-scale disruptions throughout the transitional period, to employees and producers alike, but the end result would be a net gain to Canada as specific safeguards were inserted to guarantee levels of employment and production.<sup>4</sup> The Automotive Adjustment Assistance Program was put into place to ease such adjustments.

## V — ACTUAL RESULTS

The Automotive Agreement has been of particular benefit to Canada. All the commitments made by the automotive manufacturers were more than fulfilled. There were, as expected, a number of dislocations in the industry throughout the rationalization process which affected producers and employees alike, but total benefits have far outweighed costs.

### Production

i) *Improved Efficiency.* Large efficiency gains were recorded in the Canadian automotive industry. This was shown by a substantial reduction in the number of vehicle lines produced in Canada with the resulting higher volumes for the lines selected for production in Canada.

ii) *Vehicle Production.* As is shown in Table I, the number of vehicles assembled in Canada more than doubled between 1964 and 1971, with the result that about 74 per cent of total production was exported in 1971, as compared with about 8 per cent in 1964. Table II shows that Canadian exports of passenger cars rose from over 38,000 units to over 885,000 during the same period. The domestic production-to-sales ratio, which was set at a minimum of 1.08:1 — the level for the 1964 model year, grew to 1.86:1 in 1971. Overall vehicle production in Canada advanced at a compound rate of 10.8 per cent between 1964 and 1971, as compared with an annual rate of growth of about

**Table I - Canadian Motor Vehicle Production, 1964-1972**  
(Thousand units)

Year	Total	Commercial	Passenger Cars
1964	671	111	560
1965	847	140	707
1966	872	188	685
1967	920	211	708
1968	1,150	261	889
1969	1,327	301	1,026
1970	1,194	253	940
1971	1,375	279	1,096
1972	1,474	320	1,155

Source: Statistics Canada, Motor Vehicle Shipments.

2.0 per cent for the same period in the United States. Similarly, Canadian automobile production, as a percentage of North American production, rose from 6.7 per cent in 1964 to 11.4 per cent in 1971. Accordingly, the second safeguard in the intergovernmental Agreement has been met, with a wide margin to spare.

**Table II - Canadian Exports of Passenger Cars**  
(Thousand units) 1964-1972

Year	Exports	As a Percentage of Production
1964	38.29	6.8
1965	77.88	10.0
1966	138.20	26.8
1967	342.41	48.3
1968	522.02	58.7
1969	714.55	69.6
1970	733.22	78.0
1971	821.55	75.0
1972	885.16	76.7

Source: SC, Motor Vehicle Shipments.  
Trade of Canada, Exports.

iii) *Canadian Content.* The third safeguard, which stipulated that Canadian content in Canadian-produced vehicles be maintained at the level obtained in 1964, has also been fulfilled. By 1968, the Canadian content of Canadian vehicle production was about \$100 million higher than it was in 1964.<sup>5</sup>

iv) *Canadian Value Added.* The safeguards contained in the letters of undertaking, which guaranteed growth of Canadian value added in each year by an amount equal to 60 per cent of

growth of net sales for cars, and 50 per cent growth of net sales of commercial vehicles, for a total of \$260 million by 1968, were exceeded by \$396 million.<sup>6</sup>

### Employment

Coincident with a compound rate of growth of 10.8 per cent per annum of Canadian production, and an increase in value added well in excess of the safeguards in the letters of undertaking and the intergovernmental Agreement, employment in the automotive industry in Canada grew from 69,300 in 1964 to 100,000 in 1971, at a compound growth rate of 6.3 per cent per annum.

There are three additional statistics which point to increasing efficiency in the Canadian automotive industry. Shipments per production worker in Canada grew from \$67,530 in 1964 to \$124,890 in 1971 — an increase of 85 per cent. During the same period, value added per manhour grew 54 per cent, and value added per production worker advanced 46 per cent.

### Price Differentials

The Canadian consumer has benefited greatly from the automotive pact. Cost savings, made possible by the rationalization, were translated into a decrease in the manufacturer's price differential between similar cars in the U.S. and Canada. In a statement to the House of Commons, on May 11, 1972, Mr. Pepin, then Minister of Industry, Trade and Commerce, stated that the price differential, measured in 1965 dollars in 1965 on a weighted average basis, was over 8 per cent. By 1970, the price differential was down to 3.5 per cent, and if the Canadian dollar had remained unchanged at its .925 first



of exchange with the U.S. dollar, the price differential would have been 2 per cent in 1972.

If the price differential were measured on the basis of the Canadian dollar at parity with the U.S. dollar, the Canadian car would have been, on average, 15 per cent more expensive in 1965 than a similar car in the U.S. By 1970, the gap would have narrowed to 11 per cent, and in 1972, when the Canadian dollar had actually achieved parity, the differential was about 9 per cent.

Either method of measurement, therefore, indicates that the gap narrowed by about 6 percentage points. However, recent arguments have been made that the price spread should be further reduced in view of the appreciation of the Canadian dollar.

### Balance of Payments

The single, most visible, Canadian benefit has been the shift in the balance of payments from a large deficit to a small surplus in Canada's favour on the automotive account. Both U.S. and Canadian government officials contended at the time of signing that Canada's deficit on automotive trade would decline gradually to below the \$600 million deficit recorded in 1964. Since the improvement in Canada's favour was much more rapid than anticipated, the automotive trade balance has become one of the most contentious issues in present Canada-U.S. trade negotiations.

In 1964, Canada's automotive exports stood at \$97 million, while automotive imports were \$99 million, leaving Canada with a deficit of \$2 million. By 1970, this deficit had been almost entirely erased, and a surplus of \$202 million was recorded in that year, as Table III indicates.

In 1971 the surplus almost reached the same level as in 1970, but preliminary figures for 1972 indicate a near balance. The above figures are somewhat misleading in that they include sales of snowmobiles, which showed a surplus of \$96 million and \$64 million in 1971 and 1972 respectively. Therefore, if snowmobile sales are excluded from the automotive statistics, Canada was again in a deficit position with the U.S. last year.

### REASONS FOR CANADA'S GOOD PERFORMANCE

Forecasting automobile sales is a most difficult task, as public tastes change very rapidly, and the industry as a whole is subject to significant cyclical swings. Table IV indicates the pattern of new motor vehicle sales in Canada from

**Table III - Canada's Automotive Trade with the U.S., 1964-1972**  
(\$ million)

Year	Exports	Imports	Balance
1964	97	699	- 602
1965	246	968	- 722
1966	884	1,535	- 651
1967	1,630	2,109	- 479
1968	2,591	2,923	- 332
1969	3,440	3,511	- 71
1970	3,384	3,182	202
1971	4,119	3,925	194
1972	4,624	4,619	6
Total	\$21,015	\$23,471	- \$2,456

Source: External Trade Division, Statistics Canada.

**Table IV - New Motor Vehicles Sales in Canada, 1964-1972<sup>1</sup>**  
(Units)

Year	Total	Commercial	Passenger Cars
1964	725,879	109,120	616,759
1965	830,995	122,279	708,716
1966	827,431	132,611	694,820
1967	815,307	135,872	679,435
1968	889,453	147,538	741,915
1969	917,505	156,702	760,803
1970	774,241	133,881	640,360
1971	940,332	159,570	780,762
1972	1,065,621	206,662	858,959

<sup>1</sup> Includes vehicles manufactured overseas.

Source: Statistics Canada, New Motor Vehicle Sales.

1964 to 1972. A critical element in all manufacturers' plans was to ensure that the commitment to the Canadian Government would be met in the event the industry suffered an unpredictable cyclical downturn, as penalties for non-fulfilment of commitment were most severe. Accordingly, wide safety margins were essential for the manufacturers.

Also, any additional plants planned for Canada were to supply the whole North American market. Since the U.S. automotive market is about ten times as large as Canada's, any new Canadian plant additions designed to supply the North American market would have a significant, positive effect on Canadian trade flows.

### Surge in Demand for Small Cars

The Ford plant in St. Thomas, Ontario, built to meet the increasing demand for small cars, had

exactly this effect on Canada's trading pattern. Manufacturers underestimated the surge in demand for small cars in North America, and thus Canada gained heavily from this forecasting error. If public tastes had changed in favour of larger cars, the manufacturers would indeed have had difficulty in meeting their commitments.

Every analysis of the impact of the Agreement on the U.S. trade balance before 1965 was based on the implicit assumption, that while production costs in Canada would decline, they would remain above those in the U.S. It is this assumption which provided the rationale for some of the safeguards upon which Canada insisted. This assumption has turned out to be invalid.<sup>7</sup> While a comparison of production costs is not publicly available, it can be argued that the automotive manufac-

turers' decisions to expand in Canada well in excess of their minimum commitments were due in part to a decline in Canadian production costs compared with those in the U.S.

## VII — PRESENT STATUS OF THE AGREEMENT

In 1971, the United States recorded a sizeable deficit in its overall merchandise trade balance — the first such deficit this century — and by 1972, the deficit had increased to \$6.3 billion. While second quarter figures for 1973 indicate that a surplus has been achieved, prospects for a continued favourable balance in the future are not bright since the United States is becoming increasingly dependent on imports to satisfy its expanding energy requirements. Since the U.S. has seen its previous surplus on the automotive account with Canada eroded in the past three years, it is unsatisfied with the present state of affairs.

### Renegotiation of Agreement

The automotive pact has been under renegotiation since 1968, but so far no consensus has been reached for changing the provisions contained therein. The United States contends that the Canadian automotive industry has reached a sufficient degree of maturity so that the safeguards can be eliminated. It argues that the safeguards were originally intended to be of a transitional nature, although this point was not documented in the original Agreement.

### Removal of Safeguards

The minimum levels of Canadian production and value added have been exceeded, and thus the safeguards have lost much of their relevance. Therefore, the removal of these safeguards, as demanded by some Congressional leaders on grounds of principle, is not the main stumbling block to a new automotive agreement. The central issue for Canada is the assurance of future growth for the Canadian industry.

### Canadian Opposition to a Totally Free Trade Agreement

It has been argued that the United States, by its

population, climate and single language, represents a more suitable location for automotive plants than Canada. Also, because of U.S. ownership of the industry most major entrepreneurial, marketing, engineering and purchasing decisions are made in the United States and are, therefore, more susceptible to direct persuasion by the U.S. Government than by the Canadian Government.

For these reasons Canada is opposed to a completely free trade agreement, with no assurance of future Canadian growth. In the words of Mr. Gillespie, the Minister of Industry, Trade and Commerce:

"The effort of the Government will be to provide for the future expansion of jobs and to secure future job opportunities for Canadians in any changes there may be in the auto pact".<sup>8</sup>

At present, negotiations with the U.S. on the automotive pact are continuing, and it appears that the United States is most forceful about removing the prohibitive 15 per cent tariff. Canadian individuals must pay on new cars purchased from dealers in the U.S. However, Mr. Gillespie insists that Canada should not remove this tariff without obtaining the assurance of an adequate share of future growth for the automotive industry for Canada.

## VIII — CANADA'S POLICY OPTIONS

A number of alternatives relating to the future of the automotive industry are open to the Canadian Government:

1. Agree to the U.S. suggestions of eliminating all trade barriers between the two countries and letting market forces alone decide where new investment should be made.
2. Retain the status quo.
3. Terminate the Agreement and revert to the situation that existed before 1965, and let each country make unilateral decisions in attempts to improve the competitiveness of its industry.

4. Eliminate the sources of irritation to the United States, but at the same time, develop some form of mechanism to guarantee that Canada will obtain a "fair share" of the North American industry production, investment and employment.

The first option is unacceptable, since Canada would have no assurances whatsoever of future growth for its industry. Given the rising protectionist mood in the United States and difficulties in reducing balance of payments deficits, there is a strong possibility that U.S. parent companies would be persuaded to favour the location of new plants in the United States. The registration of the automotive companies under the DISC program reinforces this possibility. The second option appears to be presented in the United States, and the third would invite wasteful retaliatory actions from either government and would likely be disastrous for the Canadian industry.

The most suitable option for Canada appears to be the fourth one. The aim of the mechanism should be to limit any potential dislocations in the industry, and guarantee future employment opportunities for Canada's rapidly growing work force. It should also eliminate wide fluctuations in Canada's balance of automotive trade with the U.S.

## IX — CONCLUSION

The attainment of a near balance in automotive trade in 1972 has to some extent taken away the force of arguments for urgent changes to the Agreement. In addition, a number of conservative internal problems in the United States have temporarily shifted emphasis away from the automotive pact.

It is expected that the United States will adopt a somewhat more conciliatory approach to negotiations in the future than it has during the past two years. However, a major threat still looms ahead for Canada: the possibility that the U.S. Senate Finance Committee may amend the President's trade bill, thereby terminating the Agreement, or at least stipulating a time limit for its present conditions.

<sup>1</sup> Carl E. Beigie, *The Canada-U.S. Automotive Agreement: An Evaluation* (Montreal: Private Planning Association of Canada, 1970) p. 48.

<sup>2</sup> Ibid.

<sup>3</sup> U.S. Senate, Committee on Finance, Hearings on

the Canada-U.S. Automotive Agreement, 89th Congress, 1965.

<sup>4</sup> See page 5.

<sup>5</sup> Beigie, p. 91.

<sup>6</sup> Ibid, p. 92.

<sup>7</sup> Ibid, p. 101.

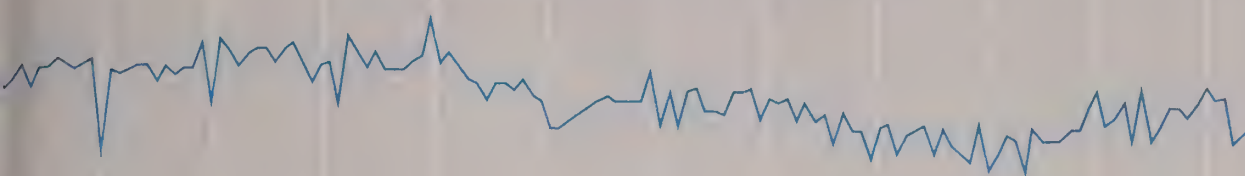
<sup>8</sup> Canada, House of Commons Debates, March 1, 1973.



# Selected Economic Indicators

## Leading Indicators

Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



Hours

42

41

40

39

Scale A

New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



\$ Billion

7.0

6.5

6.0

5.5

5.0

4.5

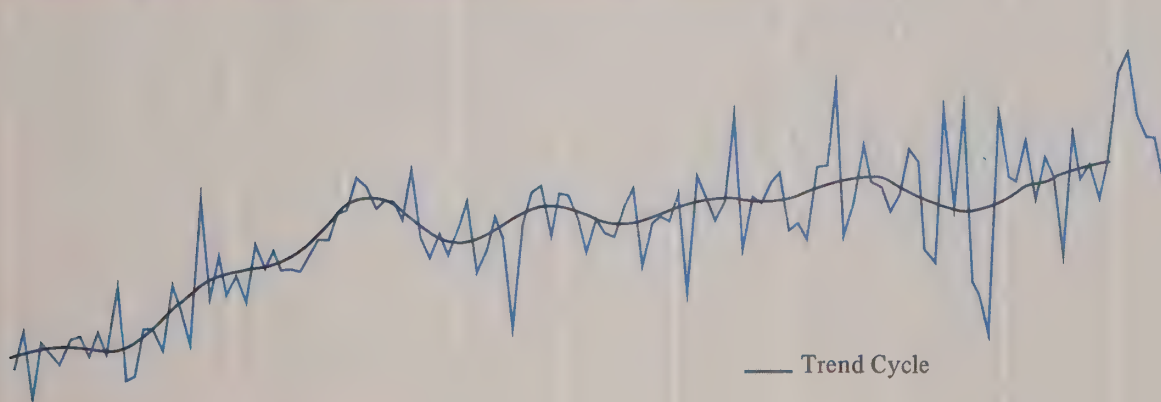
4.0

3.5

3.0

Scale L1

Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



\$ Million

200

160

120

100

80

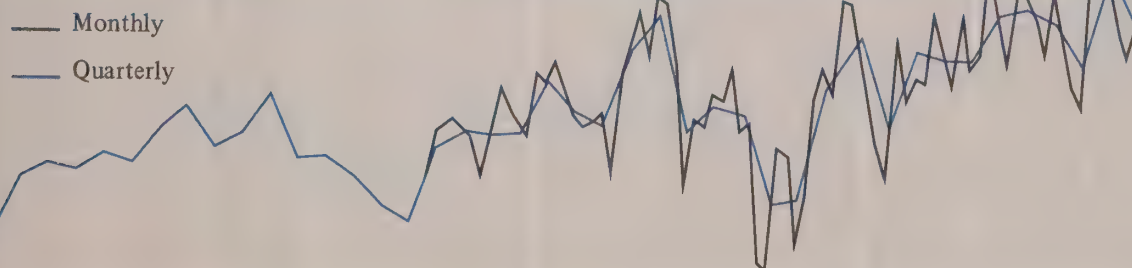
60

40

— Trend Cycle

Scale L2

Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



Thousand

100

90

80

70

60

50

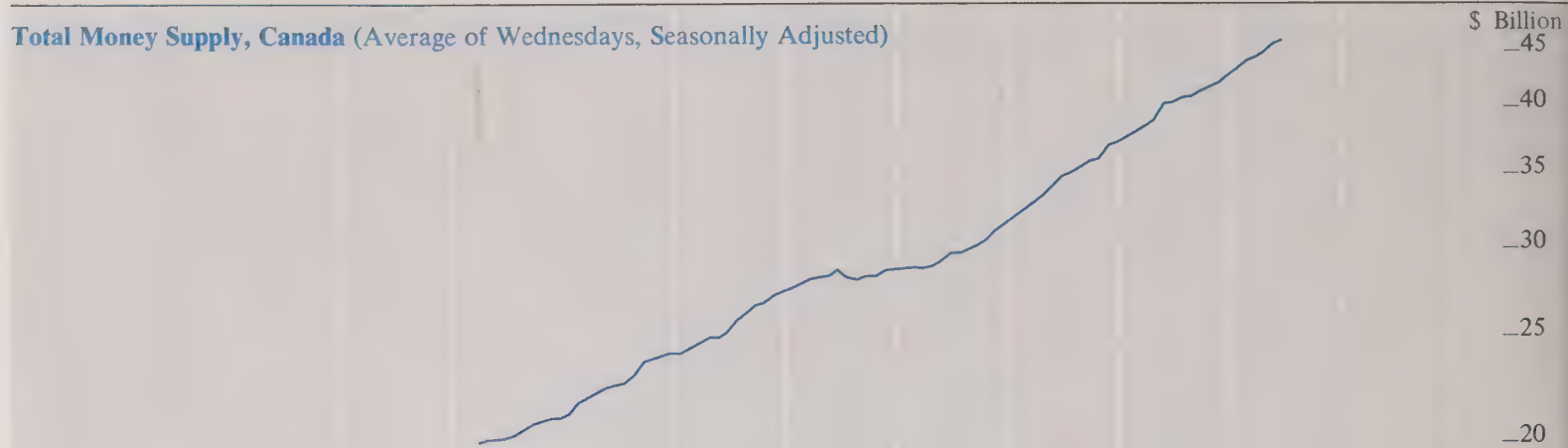
40

Scale L2

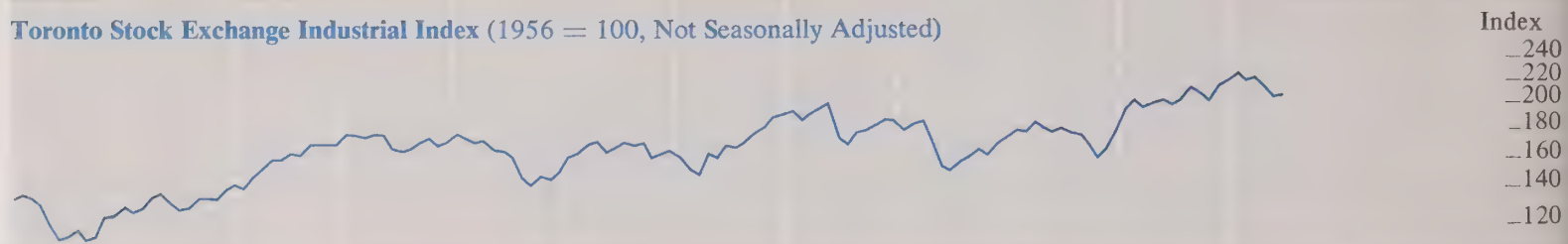
1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974

## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

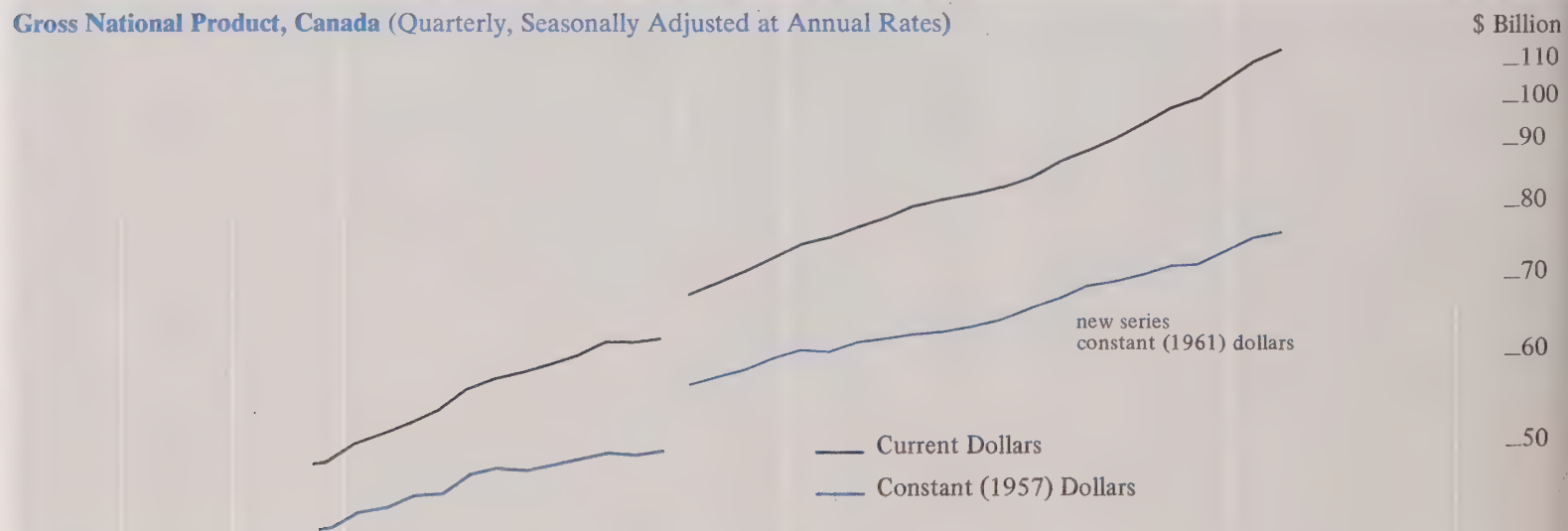


**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

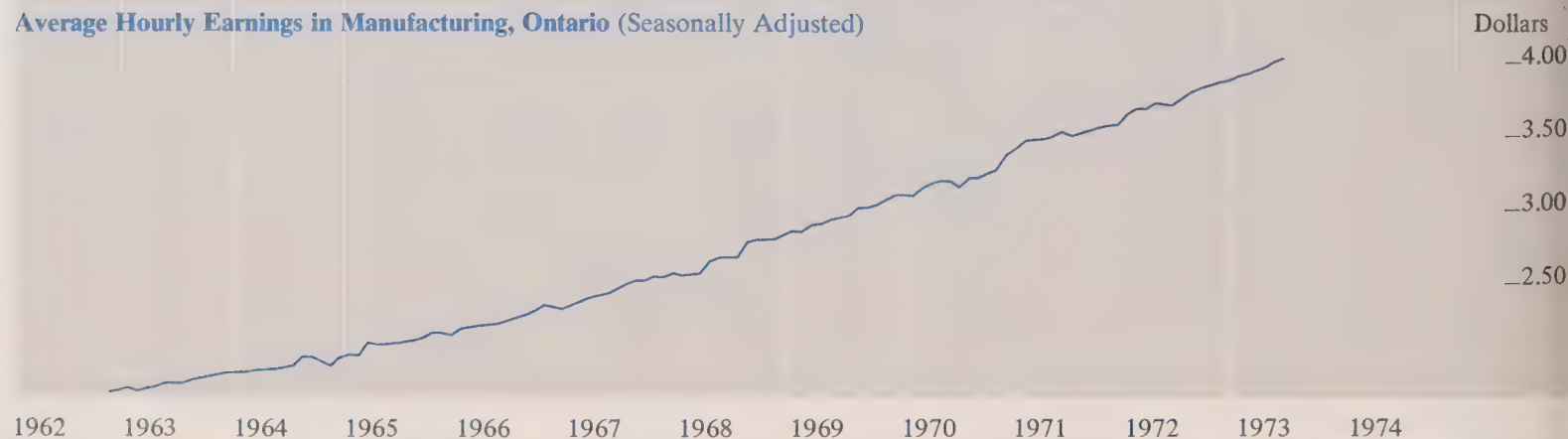


## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)



**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)



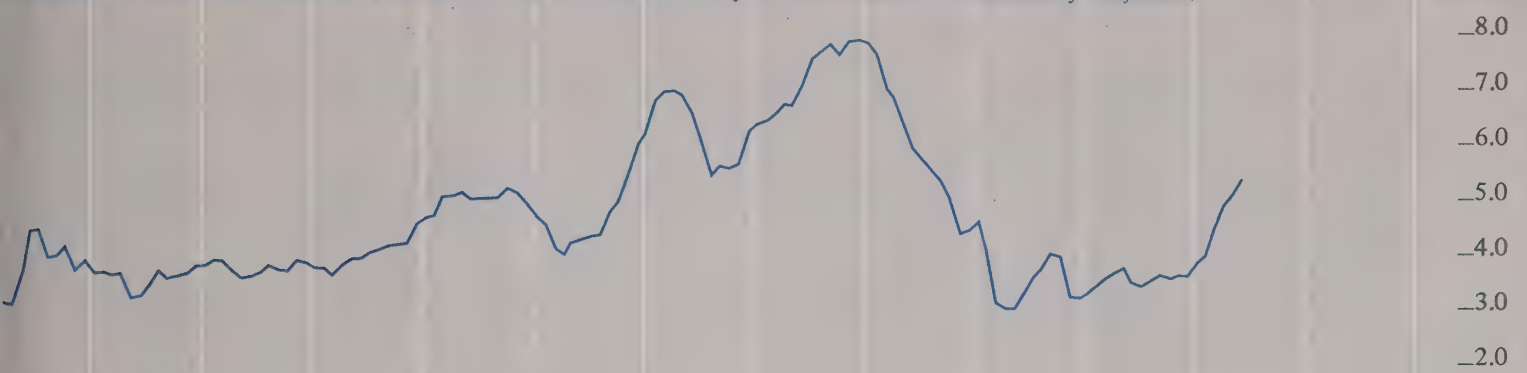


# Coincidental and Lagging Indicators

**Average Yield of 3-Month Treasury Bills, Canada** (Last Wednesday of the Month, Not Seasonally Adjusted)

Per Cent

Scale A



**Employment, Ontario** (Seasonally Adjusted)

Million

Scale L1



**Unemployment Rate, Ontario** (Per Cent of Labour Force, Inverted Scale, Seasonally Adjusted)

Per Cent

Scale A



**Index of Motor Vehicle Production, Canada** (1961 = 100, Seasonally Adjusted)

Index

Scale L2



1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974

# Economic Indicators

Seasonally Adjusted

	1972												1973											
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	May	June								
Leading Indicators																								
Average Weekly Hours Worked in Manufacturing	39.7	40.8	39.8	40.1	40.4	40.4	40.2	40.9	40.8	40.6	40.6	39.9	39.8	40.1										
New Orders in Manufacturing Industries <sup>c</sup>	4,585.3	4,642.9	4,497.3	4,472.2	4,813.4	4,844.6	4,924.7	5,019.4	5,308.7	5,379.2	5,450.8	5,381.3	5,526.2	5,450.0										
Building Permits Issued in Ontario, Non-Residential Construction	110.5	99.2	85.6	121.2	107.1	113.4	103.4	122.5	163.0	178.9	136.2	124.9	124.0	102.7										
Urban Housing Starts (Annual Rate)	108,600	106,700	97,000	82,700	108,500	91,600	71,800	66,500	116,000	118,200	114,600	91,500	82,300	93,100										
Money Supply <sup>c</sup>	40,507	40,649	40,862	41,280	41,515	42,028	42,287	42,837	43,554	44,165	44,511	45,038	45,840	46,194										
T.S.E. Industrial Index <sup>u</sup>	204.0	199.7	204.8	214.1	210.8	203.2	215.4	221.6	223.0	220.8	223.8	215.3	205.9	208.8										
Business Failures <sup>u</sup>	153	94	84	101	67	100	102	82	77	129	—	92	107	85										
Business Failures — Liabilities <sup>u</sup>	7.7	4.3	3.9	7.4	4.5	4.1	13.8	3.8	3.9	8.9	—	5.9	8.6	4.9										
Coincidental and Lagging Indicators																								
Gross National Product <sup>c</sup> (Annual Rate)		102,476			104,068			107,804			112,664				115,992									
Average Hourly Earnings in Manufacturing		3.69	3.68	3.73	3.79	3.82	3.84	3.86	3.91	3.92	3.96	3.97	40.1	40.6										
3-Month Treasury Bill Rate <sup>c,u</sup>		3.73	3.50	3.46	3.50	3.62	3.57	3.68	3.90	3.99	4.46	4.90	5.18	5.48										
Cheques Cashed in Clearing Centres <sup>1</sup>		7,409	8,144	8,437	8,751	8,470	8,936	8,449	9,259	9,108	10,183	9,700	9,703	9,745										
Retail Trade		1,083	1,081	1,093	1,088	1,098	1,128	1,115	1,152	1,196	1,185	1,274	1,161.4	1,185.1										
Labour Force		3,371	3,370	3,377	3,395	3,408	3,408	3,416	3,460	3,491	3,473	3,504	3,485	3,532										
Employed		3,220	3,207	3,219	3,224	3,227	3,227	3,243	3,315	3,349	3,336	3,365	3,353	3,404										
Unemployed		151	163	158	171	181	181	173	145	142	137	139	132	128										
Unemployed as % of Labour Force		4.5	4.8	4.7	5.0	5.3	5.3	5.1	4.2	4.1	3.9	4.0	3.8	3.6										
Wages and Salaries		1,891	1,909	1,916	1,928	1,948	1,971	1,993	2,044	2,067	2,088	2,105	2,111	2,125										
Index of Industrial Employment		134.8	134.8	134.4	133.5	134.2	136.1	135.5	136.9	138.1	139.0	139.8	140.1	140.2										
Index of Industrial Production <sup>c</sup>		192.8	194.0	194.0	192.6	195.4	200.4	202.7	203.9	212.2	212.3	212.7	212.3	214.6										
Total Manufacturing <sup>c</sup>		188.3	190.9	191.6	189.8	191.9	194.3	197.0	199.2	210.3	210.2	208.9	208.7	210.6										
Non-Durables <sup>c</sup>		167.5	172.0	170.4	169.1	171.4	172.7	173.7	175.5	181.4	179.9	181.9	182.8	184.6										
Durables <sup>c</sup>		214.6	214.8	218.5	216.1	217.9	221.5	226.5	229.2	246.7	248.5	243.0	241.5	243.6										
Mining <sup>c</sup>		197.2	189.3	185.3	185.0	192.8	210.9	212.8	207.2	203.7	207.8	215.9	213.5	213.4										
Electric Power and Gas Utilities <sup>c</sup>		224.3	228.2	228.3	227.9	229.2	236.4	236.5	239.0	242.6	238.1	240.9	241.1	250.4										
Primary Energy Demand (Annual Rate)		71.74	72.90	73.58	73.16	74.64	76.15	76.56	75.43	77.83	74.93	75.97	78.52	79.05										
Exports (including re-exports) <sup>c</sup>		1,666	1,722	1,527	1,637	1,603	1,842	1,890	1,834	1,957	2,000	2,044	2,023	1,986										
Imports <sup>c</sup>		1,532	1,535	1,510	1,560	1,554	1,655	1,662	1,686	1,872	1,895	1,737	1,922	1,878										
Unclassified Indicators																								
Foreign Exchange Reserves <sup>c,u</sup>		5,210	5,376	5,349	5,358	5,370	5,372	5,191	5,189	5,203	5,128	5,061	5,013	5,011										
Industrial Materials Price Index <sup>c,u</sup>		293.9	295.5	294.9	300.3	303.2	317.4	319.4	324.4	347.5	352.0													
Consumer Price Index <sup>c,u</sup>		138.3	138.5	140.2	141.3	141.8	142.0	142.3	143.3	145.3	145.7	147.3	148.4	149.7										
Toronto <sup>u</sup>		133.4	133.9	135.7	135.9	136.6	136.2	136.6	137.7	139.4	140.1	141.3	142.5	143.6										
Ottawa <sup>u</sup>		134.7	134.9	136.1	137.4	137.9	137.6	138.2	139.1	140.2	141.2	142.5	144.0	145.3										
Thunder Bay <sup>u</sup>		107.1	106.6	107.2	108.4	108.9	108.5	109.1	109.5	111.2	111.1	112.2	113.2	114.2										
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>		0.72	0.72	0.71	0.71	0.71	0.70	0.70	0.70	0.69	0.69	0.68	0.67	0.67										

<sup>c</sup>Statistics for Canada.







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# Ontario Economic Review

July/August 1973  
Volume 11, Number 4

Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. John White,  
Minister of Treasury, Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



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## A Long-Term Economic Forecast for Canada and Ontario

Clifford B. Jutlah, *Economist*  
Policy Planning Branch

A publication of the  
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Hon. John White  
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*Deputy Minister*

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### About the Review

The July/August edition of the *Ontario Economic Review* features a conditional forecast of the Canadian economy to 1985 and the Ontario economy to 1980. Large-scale econometric models utilizing Statistics Canada data and estimates of the Ministry of Treasury, Economics and Intergovernmental Affairs were employed in projecting on a year-by-year basis the course of variables such as aggregate income and expenditures, labour force, employment, balance of payments items, prices, interest rates, and capital requirements and supplies.

Some of the main preliminary results for the present decade are that Canada's real GNP growth would average just over 5 per cent per year, while Ontario's real GPP growth would average just over 5.5 per cent per year, that Canada's net foreign trade growth would be a primary source of weakness in aggregate demand, that severe inflation, high interest rates, and tight capital markets would prevail, and that Canada's unemployment rate would decline gradually to 4 per cent by 1980.

The forecast was prepared by Dr. Clifford Jutlah in the Policy Planning Branch of the Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs.



# Long-Term Economic Forecast for Canada and Ontario

Ford B. Jutlah, *Economist*  
Policy Planning Branch

## INTRODUCTION

This paper provides the results of a conditional economic forecast for Canada to 1985 and for Ontario to 1980. The forecast is designed to provide a background for policy evaluation and assist in producing a consensus on future trends. In this way, it is hoped to develop in a series of forecasts a quantitative foundation against which to test economic policies and alternative environments. The results, therefore, are to be taken as exploratory rather than definitive.

The projections here are based on two econometric models — modified TRACE (from the University of Toronto) and ONFORM<sup>1</sup> developed by the Ministry of Treasury, Economics and Intergovernmental Affairs). These models have been employed to provide a systematic procedure for obtaining a consistent set of projections for each year for some of the more important indicators of economic activity.

The results reported here for Canada are based on the TRACE model, while those for Ontario are obtained from the ONFORM model.

The exogenous variables have been assigned values in their most probable range, and in this sense the present set of results might be considered a "basic forecast". Since the use of fore econometric models considerably facilitates the examination of alternative scenarios of future economic conditions, numerous experiments were performed to simulate changes in policies and in world economic conditions. The forecast of average growth rates presented here would not be significantly different for small changes in the postulated conditions, though the timing of cycles might be affected. Policies very different from those experienced in the past, as well as dramatic changes in economic conditions, constitute separate studies which are being undertaken to examine specific issues. An example of such changes is the Mackenzie Valley Gas Pipeline Project, whose effects are part of the basic forecast.<sup>2</sup>

The forecast was prepared in early 1973, at which time the *National Income and Expenditure Accounts* containing the preliminary 1972 estimates were available from Statistics Canada. The econometric models were "tuned" to approximate these results and to solve for subsequent years. Rates of increase calculated for 1972 and 1973 and reported here are, therefore, based on the models' solutions for 1972 rather than the actual (or even preliminary) 1972 figures. In general, the discrepancies are sufficiently small to be ignored in the context of a long-term forecast such as this.

## II — CRITICAL ASSUMPTIONS

Any view of the future of an economy is conditional upon the framework assumptions that are made in a number of key areas. These areas may be broken down into three broad categories. Firstly, there are demographic and social changes; secondly, government socio-economic policies; and thirdly, international conditions.

### 1. Demographic and Social Trends

Demographic data to 1985 provide two essential pieces of information:

- *Population* — depending upon migration and fertility and death rates.
- *Labour force* — depending mainly on age distribution of population but, to some extent, on economic circumstances and social trends.

There are clearly some important imponderables here; but based on past trends and on considered opinions as to future attitudes to work, employment, retirement, hours of work, and vacations, the following assumptions have been made:

- i) The fertility rate for Canada and Ontario is 2.13 children per woman of child-bearing age.
- ii) Immigration to Ontario will amount to 60,000 per year. Of this total, 45,000 will come from abroad and 15,000 from within Canada, each year. Net migration to Canada from abroad is assumed to be 100,000 per year.
- iii) The participation rate for the primary population (men 25 to 54 years of age) is assumed to 96 per cent.
- iv) The participation rate for the secondary population (men 14 to 24, men 55 to 65, and women 14 to 65) varies over the forecast period. This rate is endogenously determined since it is related to the rate of unemployment and the level of wages.

### 2. Government Socio-Economic Policies

Government socio-economic policies extend over a very wide range from the fiscal and monetary areas through trade and investment to labour and social welfare. Some of these components are difficult to anticipate fully, but trends and pronouncements may be taken as indicators of the broad shape of developments. Assumptions about some of the major policy instruments which would influence long-term

economic activity in Canada are outlined below:

- i) Taxation rates in all categories are set at the levels proposed by the 1972 and 1973 federal budgets, and as levied by provincial and municipal authorities during the latter part of 1972.
- ii) Government current expenditures on goods and services (total, all levels of government) are projected as a first approximation on the basis of demographic trends and services provided by the public sector. Adjustments were then made on the basis of the resulting overall forecast to deal with the problem of fiscal drag and to produce a new overall forecast.
- iii) Government capital expenditures (total, all levels of government) are projected on the basis of trends and capital projects associated with public services.
- iv) Government transfer payments (total, all levels of government) consist mainly of transfers to persons and interest payments on the public debt but include minor items, such as subsidies. Transfer payments to persons are first projected on the basis of demographic changes and trends in social policy and then adjusted to take account of forecast economic conditions of inflation and unemployment. Interest on the public debt is assumed to grow at an annual rate of 8 per cent.
- v) Ontario Government outlays at both the provincial and municipal levels are assumed to grow at the same rate as all government spending for Canada as a whole. No distinction is made in the ONFORM model between current and capital outlays by the governments at the regional level.
- vi) The money supply is assumed to increase by 10 per cent per year starting in 1974. Canadian interest rates are endogenously determined.
- vii) Housing policy is represented by the total number of units started each year. No explicit policy measures are implied by this assumption, although there is a general expectation that governments will act on many fronts to meet these projections.
- viii) Government investment required to complement resource projects of major magnitude has not been included in the forecast. The Mackenzie Valley Pipeline is a major project, in these terms, and its implications are thus not included in the forecast.

### 3. International Conditions

International trade conditions could have a significant effect on the Canadian and Ontario economies over the next decade or more. World trade conditions are particularly difficult to predict at this time, and the scenario presented here represents only one of many. Some of the relevant figures employed in this forecast were derived from indications of U.S. forecasters, and some were based on historical projections. International monetary developments in early 1973 were incorporated in the patterns of change in international variables. The most important assumptions about international conditions that have been made in this forecast are:

- i) U.S. real GNP will grow by about 5.6 per cent in 1973, just under 4 per cent in 1974-75, close to 5 per cent in 1976-77, and 4 per cent per year thereafter.
- ii) The price deflator for U.S. GNP will increase by close to 3.5 per cent per year in the period 1973-75 and slightly less thereafter.
- iii) World exports in volume terms will grow by more than 7 per cent per year in the period 1973-75 and by about 6.5 per cent thereafter.
- iv) The U.S. dollar price of world exports will increase by close to 4.5 per cent per year to 1975 and by about 3 per cent per year thereafter. The U.S. dollar price of Canadian imports will follow a similar pattern.
- v) Yields on U.S. Treasury bills and long-term bonds are set at 5 per cent and 6.1 per cent respectively over the period 1973-85.

### III – PATTERNS OF GROWTH

In this section, the forecast behaviour of major aggregates in the Canadian and Ontario economies is described. The broad picture is presented in terms of aggregate output and demand, employment and income, prices, and international transactions.<sup>3</sup> The outlook for Canada as a whole covers not only this decade but also the first half of the 1980's, whereas coverage for Ontario extends to 1980. There are two reasons for this. Firstly, the further one looks into the future, the more obscure it becomes; and while this is true of the factors determining the course of both the national and regional economies, the obscurity at any given future date is more intense at the regional level. Secondly, the data base used in developing the two-region ONFORM econometric model (which determines the distribution of economic

**Table I – Output and Spending – Canada and Ontario  
(Per Cent Average Annual Growth Rates)**

	Canada			Ontario	
	1961-70	1971-80	1971-85	1961-70	1971-85
GNP, GPP	5.6	5.2	4.9	6.4	5.6
Consumption Expenditures	5.1	5.8	5.3	5.6	6.6
Government Expenditures	5.8	4.8	5.1	5.8	4.8
Business Investment					
Residential	4.9	1.1	0.8	7.1	2.5
Non-Residential	5.0	3.2	2.4	6.5	4.5
Machinery and Equipment	8.8	6.0	6.5	9.9	5.4
Exports	10.7	5.6	5.6	11.2	5.6
Imports	9.3	6.2	6.0	8.0	6.3

*Note: Computed from 1961 Constant Dollar Values.*

*Source: Based on data from Statistics Canada and estimates by the Ministry of Treasury, Economics and Intergovernmental Affairs.*

activity between Ontario and the Rest of Canada) is somewhat less than adequate to justify forecasting over a rather long period.

#### 1. Aggregate Output and Demand

Table I shows the growth rates in the main aggregate expenditure variables. Canada's real GNP could increase at an average annual rate of 5.2 per cent in the 1970's, as compared with 5.6 per cent in the 1960's. It may be noted, however, that the 4.9 per cent average for the 1971-85 period is about the same as that for the previous fifteen years. Ontario's real GPP, which recorded a 6.4 per cent average annual growth in the 1960's, will gain 5.6 per cent per year in the 1970's.

It would appear that in the 1960's the main impetus to growth came from business capital expansion and a strengthening foreign trade balance. This was associated with the Auto Pact and a relatively low fixed exchange value for the Canadian dollar. Ontario, with its manufacturing base stimulated by the auto industry, was the major beneficiary in these circumstances. Automotive exports, mainly to the United States, brought the foreign balance to a surplus position as the industry grew exponentially.

In the present decade it seems unlikely that such momentum will persist. Ontario's deceleration

would then be reflected in Canada's overall performance. Business capital expansion is expected to moderate in growth, when compared with the 1960's; and the foreign balance is seen as exerting some drag on the growth path. Undoubtedly, the currency alignments of 1971 and early 1973 could enable Canada to make export gains in markets other than the United States. But with the growth in exports to the United States decelerating, gains in other markets are unlikely to be so large as to produce the same kind of impact that the Auto Pact made in the 1960's. Table I suggests that, unlike the situation in the 1960's, imports could grow faster than exports in the period 1971-85 – especially in this decade – and the slower GNP growth in the 1970's is largely attributable to intensified foreign leakage. Counteracting this negative factor to some extent, however, is a somewhat faster growth in consumption spending in the 1970's, relative to the earlier decade. This is due in part to fiscal reform.

The forecasting methodology used for this study does not presume that the economy will follow a smooth full employment growth path. Many of the exogenous variables are assumed to grow at variable rates, and the growth path of endogenous variables then emerges from the economic system's intricate interdependencies.



h a concurrent and a lagged sense). There is a constraint that markets for goods and services and factors be equilibrated in each period. However, the floating exchange rate is used as an equilibrating device for the balance of payments. Given the possibilities for disequilibrium in some of the aggregate markets, adjustments are allowed to work themselves out over time. With variable growth rates in exogenous factors imposed upon such adjustments, the paths of the major aggregates exhibit "cyclical growth" over the forecast horizon.

Figure I shows the year-to-year rates of increase in Canada's real GNP and Ontario's real GDP. Strong growth from 1971 to 1974 is expected to give way to a marked slowing down after 1975. The next expansion culminates in 1978, and the growth cycle troughs in the early 1980's. During the 1970's, Ontario's pattern of growth is likely to be similar to that of Canada. If, in the latter half of the decade, major energy developments occur in Western Canada, Ontario's growth may be closer to Canada's average, but the forecast does not include this factor.

The pattern of private investment in Canada is shown in Figure II. The total number of housing units started each year is assumed to be about 250,000 until 1977, rising to about 300,000 in the early 1980's. These totals are very similar to those projected by the Economic Council of Canada.<sup>4</sup> The composition of these totals, as between single and multiple dwelling units, also follows the Council's projections. It should be noted that much of the volatility associated with residential construction has been removed in the projections for the decade. Real residential construction expenditures, which are based upon housing starts, are therefore relatively constant over the forecast period. Real expenditures on non-residential construction and machinery and equipment grow unevenly, but the trend in the construction component is less steep than that of machinery and equipment. The overall result is the phasing in these categories of investment slowing down in 1974 and 1975, rapid expansion in the rest of the decade, and contraction in the early 1980's.

On the question of regional disparities, the forecast indicates a faster rate of expansion for Ontario than that for the Rest of Canada. In per capita terms, Ontario's real GPP could rise from the 1970 level of \$3,400 to \$5,000 by 1980. For Canada as a whole, per capita GNP is expected to increase from \$3,000 in 1970 to \$4,300 by 1980. Despite DREE and other public measures, the income gap will thus widen as the decade closes, but the rate at which Ontario

will gain over the rest of the country will be slower than that during the 1960's.

## 2. Employment and Income

The growth of the Canadian labour force is not exogenously determined in the forecast. As mentioned earlier, the primary labour force is assumed to be about 96 per cent of the primary population (males 25 to 54 years of age)<sup>5</sup>, so that growth in this component depends on demographic changes. However, the secondary labour force participation rate is related to economic factors; growth in the secondary labour force thus depends on both demographic changes and economic activity. Figure III shows the forecasts for labour force growth in Canada and Ontario. The relatively high rates of growth recorded in the early 1970's — well over 3.1 per cent for Canada and over 3.5 per cent for Ontario — are expected to decline in the mid-1970's and to settle at about 2.9 per cent by the end of this decade. As Table II shows, the difference between the average growth for the 1970's and that for the 1960's will be fairly small for Canada, but almost nil for Ontario.

Employment growth for both Canada and Ontario could, on the average, be higher in the 1970's than that in the previous decade. Until quite late in this decade, the employment growth rate is likely to exceed the labour force growth rate; but in subsequent years little difference in the rates is expected. The patterns of employment growth are depicted in Figure IV.

With these patterns emerging for the labour force and employment, it is expected that the Canadian unemployment rate will gradually fall

to about 4 per cent by 1980, and thereafter fluctuate around this level. For Ontario, a more rapid decline in the unemployment rate in 1973-75 is forecast; and as Figure V shows, from the mid-1970's onwards the rate will vary between 3.3 and 4 per cent. These results for Canada and Ontario are attributable to generally buoyant economic activity as well as a slowing down in the growth of the labour force, after a period of rapid expansion in the early 1970's.

Labour income — wages, salaries, and supplementary income — will grow in nominal terms at an average annual rate of about 11 per cent over the period 1971-85. This is sufficiently rapid to provide for an increase in real wages (using the GNP deflator) of about 3 per cent, per year, per employed person in Canada. Net corporate profits will fluctuate with the swings in activity over the period, but the underlying growth factor will be about 7 per cent per year.

Personal income is forecast to grow at about 10.5 per cent per year in Canada between 1971 and 1985. This is still larger than the growth in disposable income, despite the fiscal reforms implemented in the first few years of the 1970's and the proposed changes for subsequent years. However, the difference between the average growth rate for personal income and that for disposable income is smaller in the 1970's than that in the 1960's — fiscal reform undoubtedly helps to account for this. Using the GNP deflator, one expects real disposable income per person in Canada to grow at a fractionally higher rate in this decade than the 3.5 per cent average annual recorded in the 1960's. In general,

**Table II — Labour Force, Employment, and Income — Canada and Ontario**  
(Per Cent Average Annual Growth Rates)

	Canada			Ontario	
	1961-70	1971-80	1971-85	1961-70	1971-80
Labour Force	3.0	3.1	2.9	3.2	3.2
Employment	3.2	3.3	3.1	3.3	3.4
Personal Income <sup>1</sup>	10.1	10.9	11.1	10.7	11.5
Personal Disposable Income <sup>1</sup>	8.6	10.4	10.5	9.1	10.8

<sup>1</sup> Computed from current dollar values

Source: Based on data from Statistics Canada and estimates by the Ministry of Treasury, Economics and Intergovernmental Affairs.

Fig. 1

Percentage Annual Growth of Gross National Product and Ontario Gross Provincial  
Product in 1961 dollars

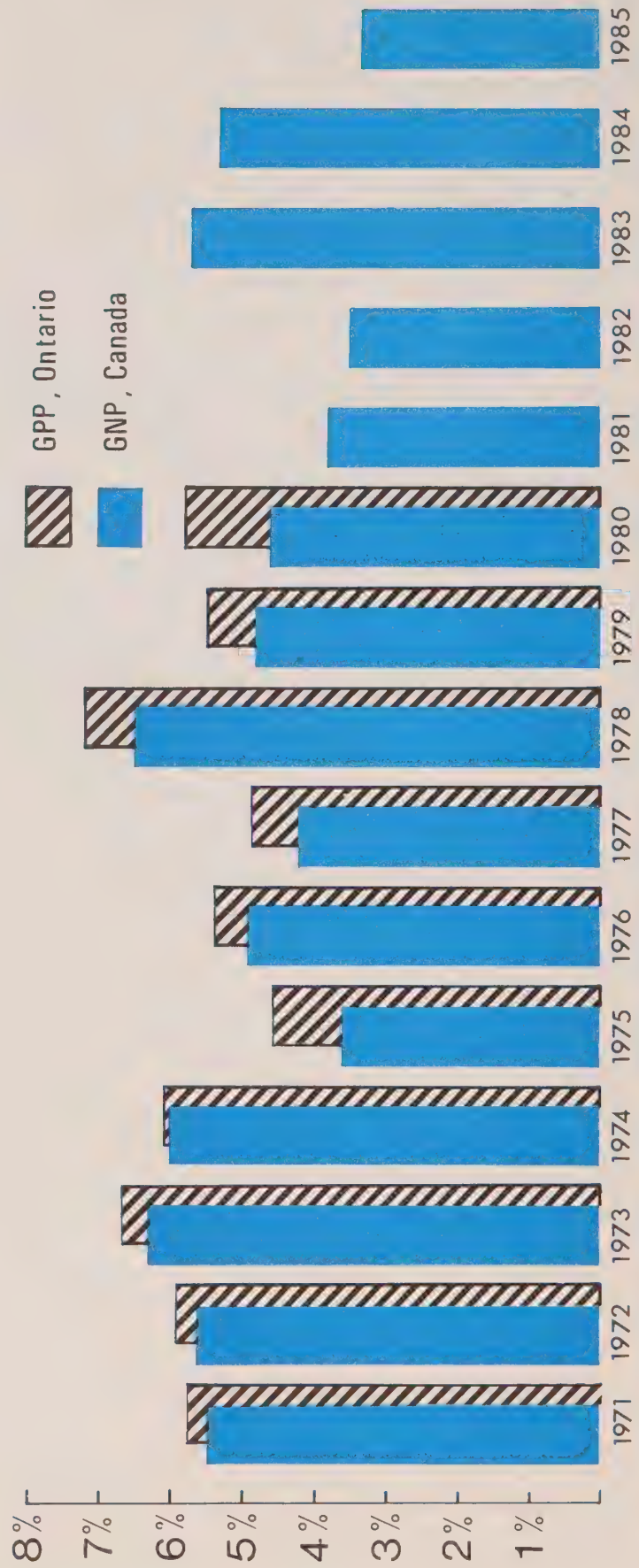




Fig. II

# GROSS PRIVATE FIXED INVESTMENT IN CANADA IN 1961 DOLLARS



Fig. III  
Percentage Annual Growth of Labour Force in Ontario and Canada

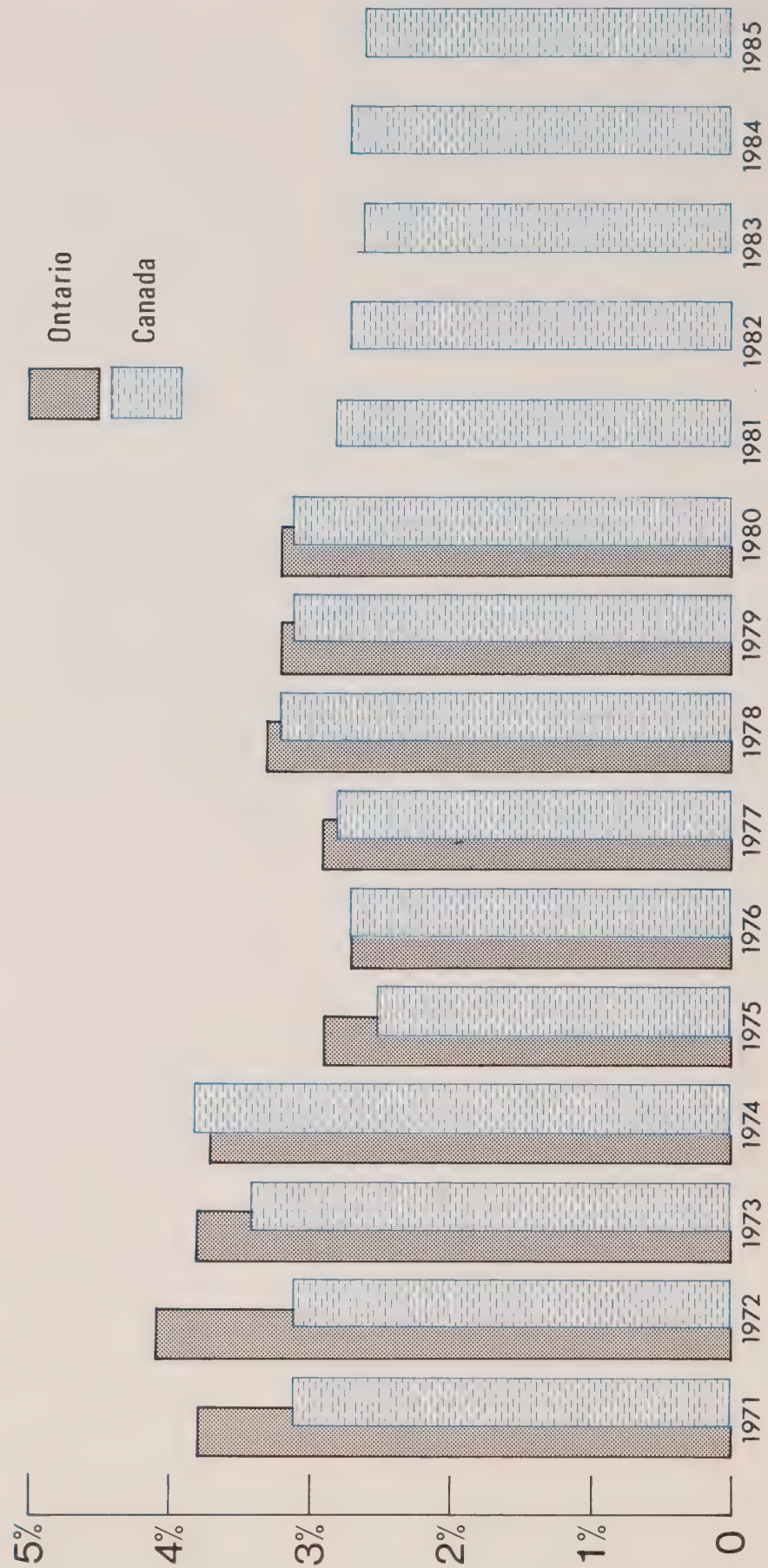




Fig. IV

## Percentage Annual Growth of Employment, Ontario and Canada

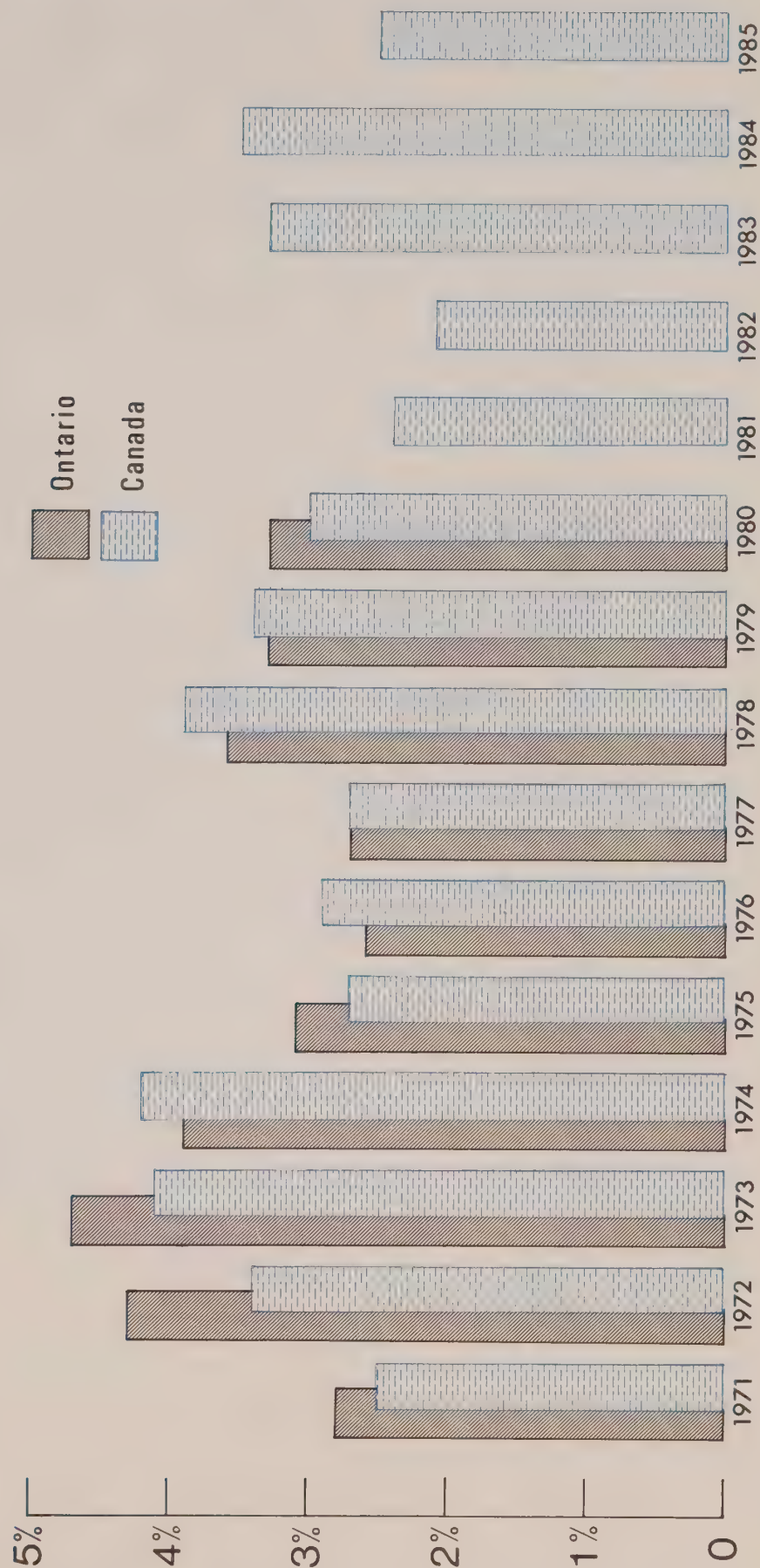
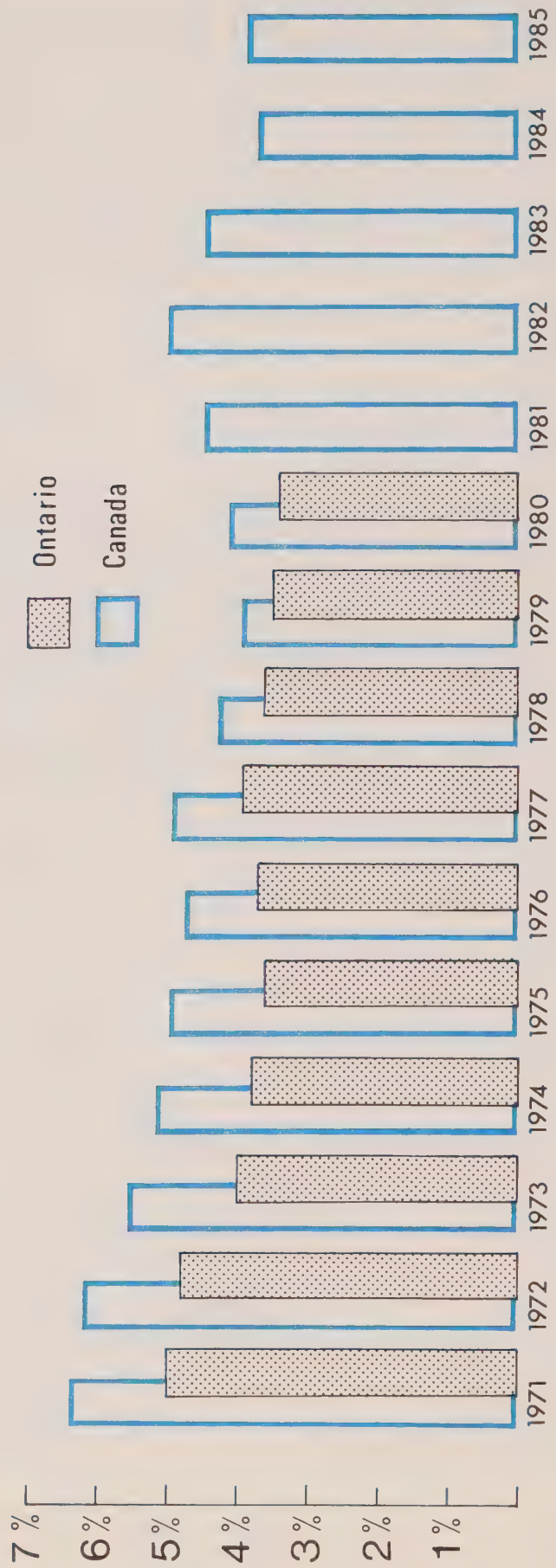


Fig. V  
PERCENT OF LABOUR FORCE UNEMPLOYED, CANADA AND ONTARIO





ome growth in Ontario could be slightly higher than overall growth in Canada, but cyclical patterns are expected to be much the same. Figure VI shows for selected years the distribution of personal income in Canada. Over the long term, the portion absorbed in taxes would rise from about 19 per cent in the first half of the 1970's to close to 23 per cent by the mid-1980's. This would be mainly at the expense of consumption spending, whose share is likely to decline from about 76 per cent in 1970 to about 72 per cent by 1985.

#### Prices

Table III summarizes the price aspects of the forecast. In general, higher rates of inflation are seen in this decade than those experienced in the last decade. And this prospect stands out more than any other in the aggregate picture. Two factors of fundamental importance to the result are the recent international monetary adjustments and a relatively high utilization of production capacity at home. Depreciation of the Canadian and U.S. currencies, vis-à-vis other major world currencies from 1971 to 1973, will have lagged effects for quite some time. Prices of imports into Canada adjust upwards. Domestic factors, however, appear to contribute more than international factors to an inflationary outcome. Activity in which domestic content predominates — residential and

**Table IV — Balance of Payments — Selected Items**  
(Billions of dollars)

Year	Merchandise Balance	Services Balance	Current Account Balance (including Transfers)	Net Long-Term Capital Inflow
1960	-.15	.96	-1.23	.93
1965	.12	-1.28	-1.13	.86
1970	2.91	-2.02	1.04	.74
1975	1.01	-3.27	-1.93	2.13
1980	1.97	-5.48	-3.04	3.55
1985	3.59	-8.24	-4.03	4.63

*Source: Based on data from Statistics Canada and estimates by the Ministry of Treasury, Economics and Intergovernmental Affairs.*

non-residential construction, government purchases, and spending on consumer non-durables and services — is forecast to show the most rapid rates of price increase. The course for the rate of unemployment suggests that the economy could operate fairly close to capacity for a large part of the period, with expected bottlenecks and shortages. This will be especially true

in the case of construction activity, where the supply of skilled manpower is not entirely elastic. The price deflator for GNP is forecast to rise at a 4.9 per cent average annual rate to 1980, and slightly more slowly thereafter. The time pattern of change in this index is portrayed in Figure VII.

#### 4. International Transactions

Total exports of goods and services from Canada can be expected to grow in real terms at an average annual rate of 5.6 per cent between 1971 and 1985, with the merchandise component somewhat more buoyant than the services component. On the other hand, total imports of goods and services into Canada could grow in real terms at an average annual rate of 6 per cent over the same period, with merchandise imports growing slightly more slowly than service imports.

Import prices are likely to follow a similar pattern as export prices over most of the forecast period, with rates of increase fluctuating between 2.5 and 5.5 per cent per year. During 1973-76, however, the rate of increase in import prices could average close to 4.5 per cent per year; while export prices could increase at just under 4 per cent per year. These results in the near future reflect in large measure the recent currency realignments.

Table IV shows selected items in Canada's Balance of Payments for certain years. The merchandise surplus is forecast to fall during the mid-1970's; thereafter, to rise steadily. However, the services deficit increases steadily over the forecast period, with the net result that the

**Table III — Implicit Price Indices — Canada**  
(Per Cent Average Annual Rates of Change)

	1961-70	1971-80	1971-85
GNP	3.4	4.9	4.8
Consumption — Durables	1.3	2.1	2.0
— Other	3.1	4.4	4.6
Residential Construction	4.1	8.9	9.5
Non-Residential Construction	3.9	6.9	7.2
Machinery and Equipment	2.4	3.6	3.6
Imports	2.0	3.6	3.5
Exports	2.1	3.7	3.7
Government Expenditure — Current	5.7	5.4	5.3
— Capital	3.4	3.9	3.9

*Source: Based on data from Statistics Canada and estimates by the Ministry of Treasury, Economics and Intergovernmental Affairs.*

Fig. VI

# DISTRIBUTION OF PERSONAL INCOME IN CURRENT DOLLARS FOR CANADA

\$ billions

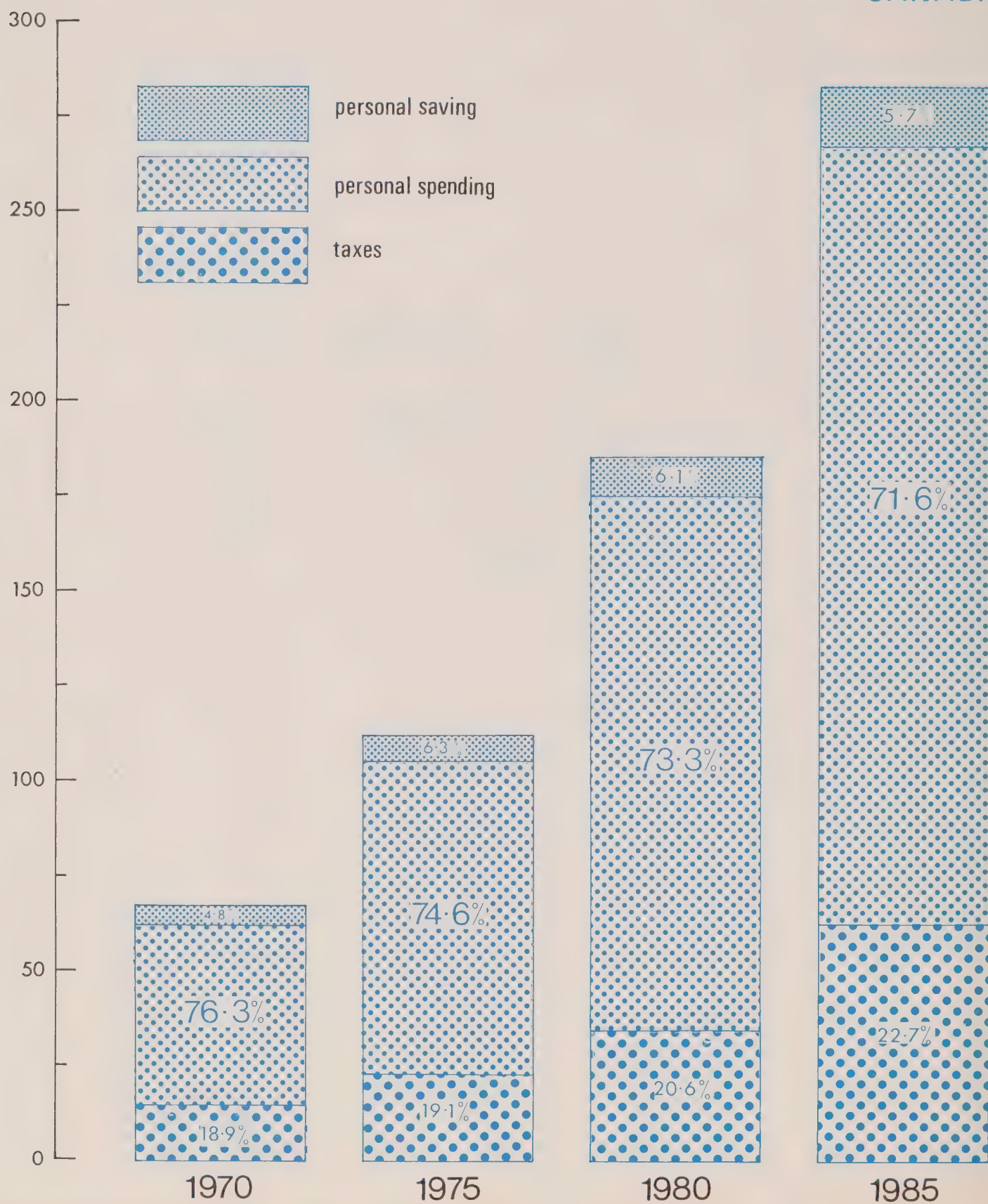
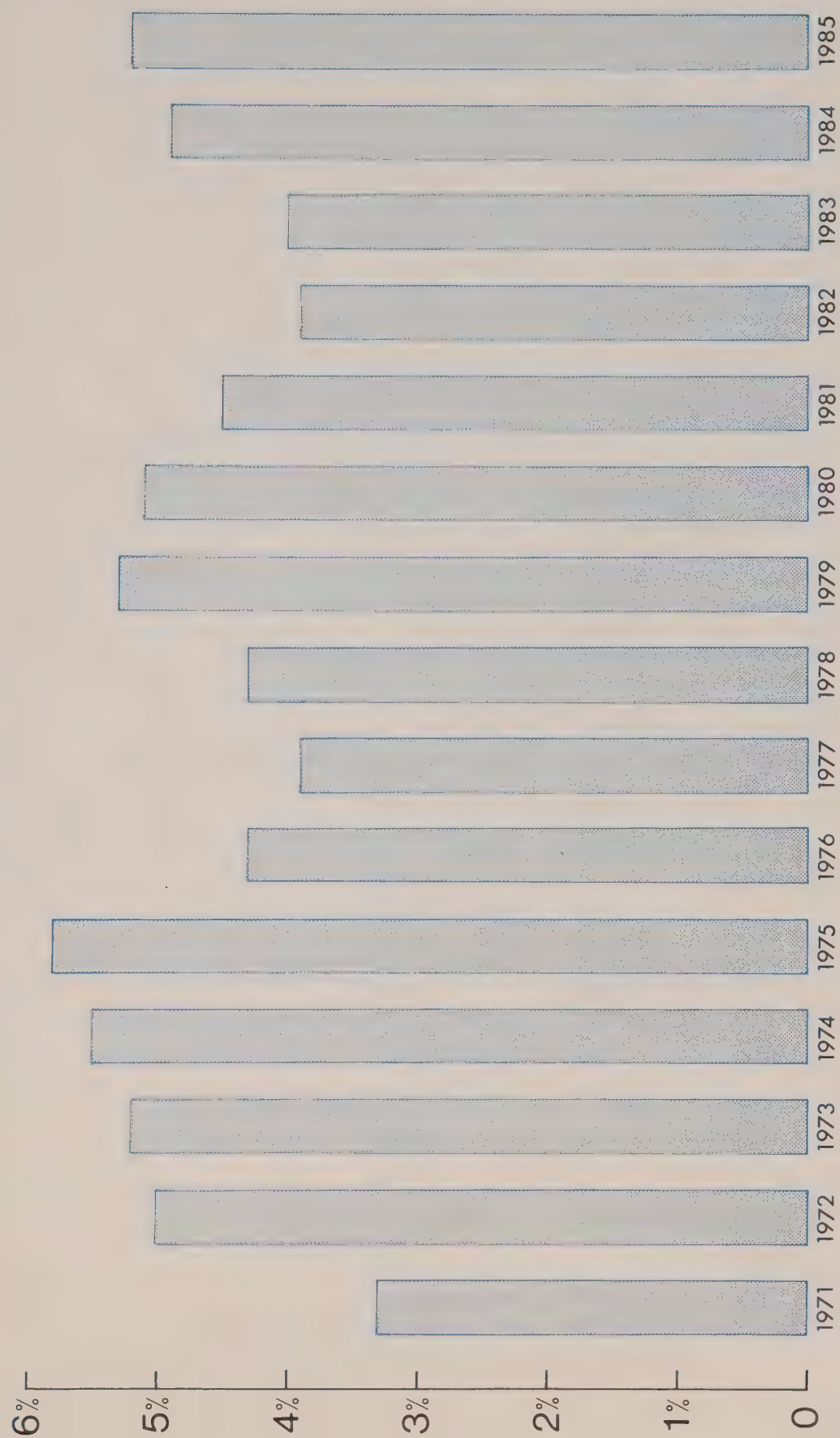




Fig. VII

## Percentage Annual Change in Prices (GNP deflator), Canada



current account deficit increases to about \$4 billion by 1985. The current account balance — as a proportion of GNP — rose from -3.2 per cent in 1960 to a maximum of 1.2 per cent in 1970, but it will fall in the forecast period and settle at about -1.3 per cent from the mid-1970's onwards.

Long-term net capital inflows will be more than sufficient to offset the current account deficit, but increasing net short-term outflows characterize most of the period.

If, as is assumed, the Canadian dollar is allowed to float freely, its value in relation to the U.S. dollar could gradually decline to a 5 per cent discount by 1980; thereafter, it is likely to fluctuate between a 2.5 and 5.5 per cent discount.

#### IV — THE GOVERNMENT SECTOR

For the purpose of the forecast, the activity of all levels of government in Canada is represented in several dimensions. Through the annual budget in the National Accounts framework, governments are viewed as providers of goods and services, employers of resources, and policy makers capable of regulating the economy in active and reactive ways. Also, through the Cash Budget and monetary policy, the financial implications of government activity are derived. The treatment of the major features of the government sector from the National Accounts viewpoint are briefly described in this section, and the financial aspects are discussed in the next section on Capital Markets.

##### 1. Government Expenditures

For projection purposes, spending by all levels of government on goods and services is disaggregated according to the economic functions provided by the public sector. Essentially, these are transportation and communications, health, social welfare, education, and all others combined.

Based on demographic changes, past trends, and anticipated developments, these functions will vary in emphasis over the period to 1985. The pressure for urbanization is expected to result in a 15 per cent annual rate of growth in spending on transportation and communications, while population demands for health and welfare services will lead to a 15 to 18 per cent annual rate of growth in spending in these areas. On the other hand, with the education infrastructure developed in the late 1960's and with a declining proportion of the population in the school-age group, spending on education could grow by less than 10 per cent per year in

**Table V — Estimated Percentage Distribution of Government Expenditures<sup>1</sup>  
on Goods and Services  
(Averaged over three-year periods)**

	1963-65	1968-70	1973-75	1978-80	1983-85
Transportation and Communications	21.0	15.4	16.8	20.0	22.0
Health and Social Welfare	6.6	9.0	12.7	15.6	17.4
Education	15.3	28.0	24.0	21.6	21.0
Other <sup>2</sup>	57.1	47.6	46.5	42.8	39.6

<sup>1</sup> All levels of government combined.

<sup>2</sup> Includes defence, security, public administration, and some smaller items.

*Source: Based on data from Statistics Canada and estimates by the  
Ministry of Treasury, Economics and Intergovernmental Affairs.*

the forecast period. Consequently, as shown in Table V, the proportion of government expenditure on goods and services allocated to transportation and communications, health and welfare will increase at the expense of education, defence, and public administration.

Looking at government expenditures on goods and services from another angle, one can expect the growth in current spending to moderate from the 13 per cent per year established in the early 1970's to about 10 per cent per year in the remainder of the decade and to exceed 10 per cent in the 1980's. Capital spending, however, which expanded sharply between 1971 and 1973 as a stimulative device, is projected to follow a more normal 9 per cent annual growth path from the mid-1970's onwards.

Apart from spending on goods and services, governments make interest payments on the public debt and operate programs mainly in the health, education, labour, and social welfare areas, which involve transfer payments to persons. Excluding interest on the debt, transfers grew at varying rates (between 15 and 20 per cent annually) in the period 1967-72. This arose from changes in the health and welfare programs and unemployment benefits structure, and from increasing unemployment and an ageing population. In the years ahead, with a better employment performance and some expansion in the social security area, transfers will increase at rates between 10 and 12 per cent annually. The Old Age Assistance component is projected to grow by 12 to 16 per cent annually as the proportion of beneficiaries continues to increase, and built-in adjustments for inflation take place.

It is assumed that in order to provide the community with various economic and social services, direct employment by governments will grow by just over 5 per cent per year, and that the wage bill for governments will increase by about 11.5 per cent per year in the forecast period.

##### 2. Government Revenues

The main sources of government revenues are personal income taxes and other direct taxes paid by persons, corporate income taxes, indirect taxes, and investment income. Minor sources include withholding taxes and levies such as health care premiums.

In forecasting revenues, it is assumed that tax rates would prevail in accordance with recent tax reform proposals and federal budgetary changes. Hence higher levels of deduction and lower tax rates for certain taxpayers as well as corporations are incorporated in future tax yields. Also, from 1974 onwards, indexing of personal income taxes is assumed.

In the personal income tax field, it is estimated that the ratio of assessed income to personal income will rise from its present level of 78 per cent to 83 per cent in 1985, while the ratio of taxable income to personal income will rise from the present 50 per cent to 60 per cent in 1985. Despite indexing (which partially offsets inflationary effects on revenues), growth in personal income combined with shifts in the distribution of income under a progressive tax rate structure will generate revenue growth averaging over 12 per cent per year between 1973 and 1985. Other personal direct taxes such as contributions to government pension



is, will grow by about 11 per cent per year. Corporate income taxes are forecast to fluctuate greatly in the forecast period as the profit varies over the cycle. Lower tax rates over the next few years, combined with the assumed continuation of the recent accelerated depreciation measures, could slow down the growth in revenue from this source.

Given the forecast for inflation, indirect taxes, based largely on expenditures on consumption, investment, and imports, will grow about 10 per cent per year, with a cyclical pattern imposed by these spending components. Investment income from the various government funds will increase by 9.5 to 10.5 per cent per year over the period.

Because of these different growth patterns in revenue components, the share of personal direct taxes in total revenues will increase from about 38 per cent at the start of this decade to about 46 per cent by 1985, while the share of indirect taxes will be relatively constant at 37 per cent, and corporate taxes will decline in importance.

### 3. The Surplus-Deficit Position

Table VI shows for selected years the relationship between the Gross National Product and the combined budget of all governments in the National Accounts framework.

Over the long term, the ratio of government spending to GNP is seen to rise slightly, after attaining a plateau in this decade. Revenue growth is curbed by recent and proposed tax policy during 1972-74; thereafter, revenue will grow faster than GNP, and the deficits of the early 1970's created by discretionary fiscal policy disappear in the mid-1970's.

Despite indexing of personal income taxes, there still exists a strong tendency for fiscal drag in the economy. In this forecast it is assumed that government will react with discretionary measures to deal with potentially large surpluses occurring from 1977 onwards. Of the variety of measures possible, it is assumed that spending on goods and services will be increased, and that transfer payments to persons will be raised in an effort to return some of the fiscal dividend to the private economy. The

effects of these measures are reflected in a rather balanced relationship between the budget and GNP over the forecast horizon.

## V – CAPITAL MARKETS

In this section, certain aspects of the financing of Canada's economic activity to 1985 are considered. Under general conditions of monetary policy set by the Bank of Canada, the capital markets serve in the process of allocating funds between borrowers and lenders and provide for liquidity of non-monetary financial assets. As part of the economic forecast, the financial picture is summarized in terms of Canada's overall capital requirements and the availability of domestic savings, interest rates, governments' financial positions, the financing of private business investment, and mortgage financing.

### 1. Aggregate Investment and Saving

Gross Capital Formation in Canada could grow in nominal terms at an average annual rate of about 9 per cent to 1985. Such growth, however, will take place with fluctuations not unlike those of the past. These fluctuations will reflect essentially the variations in real investment (shown in Figure II) as prices seem to move steadily upwards. Government capital formation, which is assumed to grow by about 9 per cent over most of the period, and residential construction, which is based on the expected number of housing units started, are projected to follow smoother trends than those of the past.

Spending by business on plant and equipment and inventories, however, will exhibit historical volatility. This is because the equations used for predictions of real investment incorporate the past behaviour of the utility and resource sectors (as well as manufacturing and services), and foreseeable expansion patterns in power plants, transportation, and resource development are well within our realm of experience. As mentioned earlier, the one major exception is the Mackenzie Valley Gas Pipeline Project, whose effects are excluded from the forecast.

Gross public and private investment in housing, plant and equipment, and inventories will total \$127 billion between 1971 and 1975, \$195 billion between 1976 and 1980, and \$307 billion between 1981 and 1985. Table VII shows the breakdown of these totals between the public and private sectors, and among the various categories of investment. It does not seem that the public share will change significantly in relation to the private share of fixed investment.

Table VI – Government Budget in Relation to GNP

	1970	1971	1975	1980	1985
	(Per Cent)				
Spending on Goods and Services	23.1	23.7	23.4	23.3	24.8
Current Expenditures	19.4	19.7	19.9	20.0	21.4
Capital Expenditures	3.7	4.0	3.5	3.3	3.4
Transfer Payments	13.2	14.0	14.3	13.9	14.6
Transfers to Persons	8.1	8.9	9.7	9.9	11.0
Interest on Debt	3.8	3.8	3.6	3.3	3.2
Other	1.3	1.3	1.0	.8	.4
TOTAL GOVERNMENT EXPENDITURE	36.3	37.7	37.7	37.2	39.5
Revenues					
Personal Direct Taxes	13.5	13.9	14.3	15.5	17.4
Corporate Income Tax	3.6	3.7	3.0	2.5	2.0
Indirect Taxes	14.1	14.0	14.0	14.0	13.8
Other	4.7	4.7	4.5	4.4	4.4
TOTAL GOVERNMENT REVENUES	35.9	36.3	35.8	36.4	37.6
Government Capital Consumption					
Allowances	1.4	1.3	1.3	1.4	1.5
plus(+) or Deficit (-) <sup>1</sup>	1.0	.1	-.6	.6	-.4

<sup>1</sup> The Surplus is the positive difference between the Total of Revenues and Capital Consumption Allowances and Total Government Expenditure.

Source: Based on data from Statistics Canada and estimates by the Ministry of Treasury, Economics and Intergovernmental Affairs.

**Table VII – Gross Investment and Saving in Canada  
(Billions of Current Dollars)**

	1966-70	1971-75	1976-80	1981-85
Government Gross Fixed Investment	15	21	32	49
Private Gross Fixed Investment	67	100	158	249
Residential Construction	16	29	45	70
Non-Residential Construction	24	34	55	84
Machinery and Equipment	27	37	58	95
Total Gross Fixed Investment	82	121	190	298
Inventory Change	3	6	5	9
Total Gross Investment	85	127	195	307
Gross Domestic Saving	83	120	183	289
Foreign Saving	2	7	12	18

*Source: Based on data from Statistics Canada and estimates by the Ministry of Treasury, Economics and Intergovernmental Affairs.*

Gross Domestic Saving in Canada could amount to \$120 billion in the period 1971-75, \$183 billion in the period 1976-80, and \$289 billion in the final five years of the forecast. Most of the saving is likely to come from capital consumption allowances, whose share could rise from 53 per cent in the early 1970's to 60 per cent by the mid-1980's. Personal saving will account for a relatively constant 24 per cent of domestic saving. The remaining proportion (attributable to undistributed corporate profits and government saving) will fluctuate downwards.

Canada's domestic saving could thus fall short of its investment requirements over the forecast period and the country could be a net user of foreign resources. Net new inflows of foreign capital in the form of long-term debt and equity investment in the Balance of Payments are forecast to represent 5.5 to 6 per cent of Canada's gross investment needs.

## 2. Interest Rates

The forecast assumes that the Canadian money supply (currency and bank deposits held by the public) will grow at a 10 per cent average annual rate from 1974 onwards – a marked slowing down from the recent past. International monetary conditions are represented in the forecast by exogenous U.S. interest rates and a weighted average value of major foreign currencies vis-à-vis the U.S. dollar. Canadian interest rates and exchange rate in relation to the U.S. dollar are endogenously determined by both domestic and foreign influences.

In general, the forecast period is character-

ized by high interest rates in Canada. The average rate on long-term (over ten years) Government of Canada bonds will be between 7.75 and 8 per cent until the mid-1970's; thereafter, it will fluctuate downwards to about 7.25 per cent in the early 1980's. The Government of Canada three-month Treasury Bill rate will follow a similar pattern as the long rate, with the former being about 200 basis points below the latter throughout most of the period.

In the absence of major currency crises in the years ahead, it is expected that a more normal historical relation between Canadian and U.S. interest rates will be obtained. The Canadian Government bill and long bond rates will be higher than their U.S. counterparts, with a differential of 50 to 100 basis points in bill rates, and 100 to 150 basis points in long bonds occurring in most of the period. These relationships are shown in Figure VIII.

Inflation on an international scale is likely to be quite severe until the mid-1970's as countries attempt to adjust to the major exchange rate changes of the recent past. One of the most obvious forms of the adjustment process is the speculative conversion of excess U.S. dollars into real commodities. It will take some years for these effects to work themselves out, and Canada, with such an open economy, cannot entirely escape the consequences. Furthermore, in Canada, the pressures of urbanization and supply inelasticities could contribute to inflation in the goods and services not internationally traded, for example, housing.

Under such conditions we can expect the high inflation factor forecast for Canada – over 5 per cent per year to 1975 and between 4 and

5 per cent in most other years in the GNP price deflator – to be built into interest rates. In other words, the level and pattern of interest rates will reflect considerably the inflation environment.

Long-term borrowers issuing fixed interest obligations could in future experience considerable difficulty in raising funds as lenders attempt to hedge against inflation. Provincial municipalities, and corporations could be in strong competition for whatever long-term funds are available. Mortgage funds, though on a renewable five-year basis for housing, could command higher interest rates than those in the 1960's as the whole structure of rates is elevated above historical levels.

It may be possible to alleviate some of the problems of cost and availability of funds in Canada's capital markets through faster growth in the money supply. However, such generalized monetary policy seems to be losing effectiveness in controlling interest rates. Furthermore, if such a policy could lower rates at the short end of the market, it would engender more inflation which would be built into long rates. Long-term borrowers would face an even more difficult situation. Monetary policy in the years ahead will probably have to assume more selective forms through moral suasion or legislative powers in assisting the capital markets in allocating funds according to policy goals. Alternatively, public institutions, such as the Central Mortgage and Housing Corporation and the former Industrial Development Bank, may be used more vigorously to meet the specific needs of housing and small businesses.

## 3. Government Financial Position

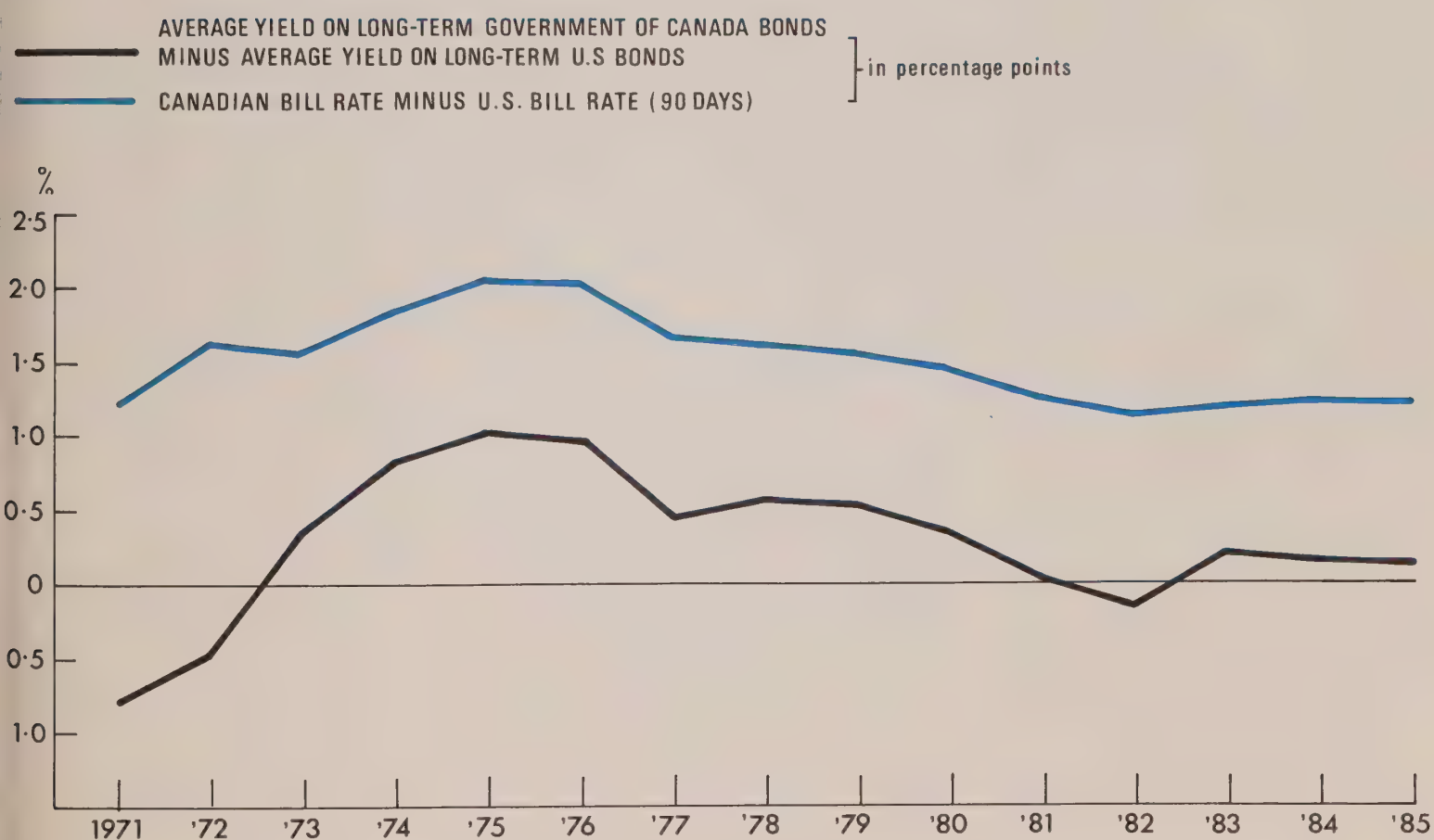
As has been indicated earlier, the combined governments in Canada will be running deficits until the late 1970's; thereafter, surpluses and deficits will alternate.<sup>6</sup> One may now consider some financial aspects of these budgetary positions.

Between 1966 and 1970 the combined governments consistently showed National Accounts surpluses ranging from \$0.2 billion to \$1.2 billion – totalling about \$3.6 billion over those five years. Since the Canada and Quebec Pension Plans, introduced in 1966, ran surpluses totalling about \$4.9 billion to 1970, it is clear that these Plans brought about a massive shift to compulsory saving and offset an otherwise \$1.3 billion in deficits by the combined governments over the period. It is estimated that these two Pension Plans will contribute total savings of about \$6.8 billion from 1971 to 1975, \$8.5 billion from 1976 to 1980, and \$)



Fig. VIII

## INTEREST RATES DIFFERENTIALS BETWEEN U.S. AND CANADIAN GOVERNMENT SECURITIES



billion from 1981 to 1985 to the position of the combined governments. The marked slowing down in the rate of growth of these sources is attributable to the faster growth of benefits paid, compared with contributions received.

Despite the surpluses in these Pension Plans, the combined governments in Canada are forecast to show deficits totalling \$3.7 billion from 1971 to 1975, a surplus of about \$0.5 billion during 1976-80, and an approximate balance from 1981 to 1985. Adjusting the National Accounts budget position to a cash basis by taking account of financial transactions, such as loans and advances made by governments, and assuming no foreign exchange financing because of the floating Canadian dollar, one finds that governments' net financing requirements will be about \$21 billion from 1971 to 1975, a similar amount from 1976 to 1980, and about \$28 billion from 1981 to the end of the forecast period.

Canada Savings Bonds (at \$11 billion outstanding in early 1973) were a major federal instrument of financing in the period 1970-72, with about \$4.4 billion net raised this way. If one optimistically assumes this same kind of success in future, the combined governments will have to obtain from net new security issues about \$10 billion in the period 1971-75 (compared with \$6.6 billion in the period 1966-1970), \$13.5 billion from 1976 to 1980, and \$22.5 billion in the period 1981-85.

Hence, governments are likely to finance in the capital markets considerably more heavily in future years. Since the federal government can rely on the Bank of Canada and since it has been vacating the long end of the market in favour of Savings Bonds, it is the provinces and municipalities that will have to float their issues in the long market. It appears that the domestic market might not be able to meet the requirements foreseen, but even if about half of the needs are raised abroad, the domestic markets would be under considerable strain. This prediction is entirely consistent with the high interest rate structure that has been forecast, and it is inextricably tied up with the general question of revenue sharing among the different levels of government in Canada.

A further problem on the horizon relates to liquidity in the economy and the implications for debt operations and monetary policy. At the federal level, the average term to maturity for marketable securities held by banks and the public fell from 8.5 years in 1961 to 4.5 years in 1972. Of the public's holdings of such securities, about 45 per cent is now less than 5 years to maturity. Also, of the total federal debt held

by the public, Canada Savings Bonds now account for about 67 per cent, as compared with 40 per cent in 1961. The Canadian economy is in a highly liquid state, and unless the trends change, it implies that the monetary authorities will have considerable difficulty in managing the reserves of the banking system. Furthermore, debt operations in an increasingly thin market for long-term government securities would be quite unsettling if actively pursued as a means of influencing the structure of interest rates. This supports the view that in order to be effective, monetary policy conducted through the capital markets will probably adopt measures which are selective with respect to policy goals rather than measures which are aggregative and generalized.

#### 4. Business Finance

The private business sector is likely to require about \$105 billion for 1971 to 1975, \$162 billion for 1976 to 1980, and \$257 billion for the remainder of the forecast period to finance inventories and capital expansion. An increasing proportion of these needs are expected to be met by internally generated funds. The private sector capital consumption allowances and undistributed profits are seen as covering 63 per cent of business capital requirements from 1971 to 1975, 72 per cent in the period 1976-80, and 74 per cent from 1981 to 1985.

This indicates that the capital markets will decline in relative significance as a source of business finance. Among the main factors responsible for this are the growth in depreciation reserves permitted by tax laws, high market rates of interest, and increased affiliate financing. Despite the declining significance of outside financing, however, it will still be true that the capital markets will play an important role in providing investment funds.

In the five years ending 1972, corporate net bond and equity financing averaged \$1.8 billion per year, with more than 86 per cent being issued in the Canadian market. In the years ahead, with provinces and municipalities intensifying their search for market funds, the ability of corporations to raise funds at home will depend crucially on the resolution of intergovernmental financing and on the extent to which governments might shift to offshore sources.

With rising interest rates forecast and with long-term fixed interest obligations finding disfavour with lenders, the business sector may have to rely more heavily on bonds with a convertible feature as a long-term vehicle; also,

bank loans could increase in significance as a method of financing.

#### 5. Mortgage Financing

The total demand for mortgage funds is generated from residential construction, business construction, and land development. With growth in construction over the forecast period with changes in land prices, and with the trend to a lower down payment-to-cost ratio for housing, the annual demand for mortgage funds is expected to grow from about \$4.4 billion in 1970 to \$11.4 billion in 1975, \$16.5 billion in 1980, and \$22.5 billion in 1985. In the respective five-year periods between 1971 and 1975, 1976-80, and 1981-85, total mortgage funds required are forecast to amount to \$47 billion, \$71 billion, and \$111 billion. The proportion of these totals required for new housing will rise from 65 per cent to 75 per cent over the period.

The total supply of mortgage funds comes from the traditional lending institutions — banks, life insurance companies, trust and loan companies — as well as other corporations, pension funds, and government. It is estimated that average growth of private financial intermediaries will be just over 10 per cent average per year in the forecast period, while mortgage assets will grow at a slightly higher rate. Also, the estimate of CMHC mortgage holdings indicates growth at an annual rate of about 8.5 per cent over the period. With such conditions and the minor role played by other lenders in providing new funds, a shortage of mortgage funds averaging about \$1 billion per year is forecast for the period 1973-85.

To narrow this gap, one possibility is for the federal government to double its present lending effort through CMHC. Other possibilities, which might involve shifts in government budgetary expenditures towards housing or which might improve the flow of funds into mortgage financing through enabling legislation will need to be explored and implemented. Real estate investment trusts and future mortgage investment corporations (relatively new sources of mortgage financing) will probably attract some new funds from other areas of the capital market, thus producing a redistributive rather than an incremental effect on the supply of capital funds. Even so, their impact on the mortgage financing gap is unlikely to be substantial. Unless the gap narrows significantly, mortgage rates might rise to unprecedented levels during the 1970's, and the spread between mortgage rates and bond rates might have to increase in order to induce private lenders to channel more of the economy's savings into mortgages.



ONFORM is a two-region (Ontario and the Rest of Canada) model estimated from annual data for 1950-69. It bears no relation to the Ontario model described in the Ontario Economic Review, March 1971, Special Supplement.

The effects of this project will be dealt with in the November/December 1973 issue of

the Ontario Economic Review in an article entitled "The Economic Impact of the Mackenzie Valley Gas Pipeline Project", Policy Planning Branch, Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs.

<sup>3</sup> Income and expenditure levels for Canada and Ontario are shown for selected years in the Appendix.

<sup>4</sup> Economic Council of Canada, "The Economy to 1980: Staff Papers" (Ottawa: Information Canada, 1972). Paper No. 5.

<sup>5</sup> Projections of the age distribution of Canada's population to 1985 were obtained from Statistics Canada.

<sup>6</sup> These deficits and surpluses are in the budget's National Accounts form.

## Appendix

Table A-1 — Canada's Gross National Expenditure, Selected Years<sup>1</sup>  
(Billions of Current Dollars)

	1971	1975	1980	1985
Personal Consumption Expenditures	54.0	83.2	130.2	197.7
Government Current Expenditures on Goods and Services	18.5	28.2	45.1	74.6
Government Gross Fixed Capital Formation	3.8	4.9	7.5	11.6
Private Gross Fixed Capital Formation	16.8	23.5	39.4	58.4
Exports of Goods and Services	22.3	32.0	50.5	76.9
Imports: Imports of Goods and Services	-22.1	-34.3	-54.0	-81.5
Other Expenditure <sup>2</sup>	.2	3.9	7.1	9.5
GROSS NATIONAL EXPENDITURE	93.4	141.4	225.8	347.2

1971 Actual, Other Years Forecast.

Value of Physical Change in Inventories plus Residual Error of Estimate.

Table A-2 — Ontario's Gross Provincial Expenditure and Income  
Selected Items in Selected Years<sup>1</sup>  
(Billions of Current Dollars)

	1971	1975	1980
Personal Consumption Expenditure	21.8	34.1	56.2
Private Gross Fixed Capital Formation	6.6	9.4	16.1
Exports of Goods and Services	11.1	16.0	25.2
Imports: Imports of Goods and Services	-9.1	-14.2	-22.3
Other Expenditure <sup>2</sup>	7.6	13.5	22.2
GROSS PROVINCIAL EXPENDITURE	38.0	58.8	97.4
NET PROVINCIAL INCOME	28.8	45.7	75.9
PERSONAL INCOME	30.0	48.3	80.1
PERSONAL DISPOSABLE INCOME	23.4	37.5	60.9

1971 Estimate, Other Years Forecast.

Sum of Government Expenditures, Interprovincial Trade Balance, Inventory Change, and Residual Error.

**Table A-3 – Canada's Gross National Expenditure, Selected Years<sup>1</sup>**  
(Billions of Constant 1961 Dollars)

	1971	1975	1980	1985
Personal Consumption Expenditures	41.6	54.1	69.7	86.2
Government Current Expenditures on Goods and Services	11.0	13.1	16.4	21.5
Government Gross Fixed Capital Formation	2.6	3.0	3.8	4.9
Private Gross Fixed Capital Formation	12.0	13.2	16.8	19.2
Exports of Goods and Services	18.2	22.7	29.8	38.2
Less: Imports of Goods and Services	17.9	23.8	31.6	41.0
Other Expenditure <sup>2</sup>	.2	.8	1.2	1.8
<b>GROSS NATIONAL EXPENDITURE</b>	<b>67.8</b>	<b>83.1</b>	<b>106.1</b>	<b>130.8</b>

<sup>1</sup> 1971 Actual, Other Years Forecast.

<sup>2</sup> Value of Physical Change in Inventories plus Residual Error of Estimate.

**Table A-4 – Canada's National and Personal Income, Selected Years<sup>1</sup>**  
(Billions of Current Dollars)

	1971	1975	1980	1985
Wages, Salaries, and Supplementary Labour Income	51.3	78.8	125.7	195.3
Military Pay and Allowances	.9	1.1	1.5	2.1
Corporation Net Profits Before Taxes	9.0	15.7	22.6	27.5
Other Income and Inventory Valuation Adjustment	9.2	12.7	21.3	33.1
<b>NET NATIONAL INCOME</b>	<b>70.4</b>	<b>108.3</b>	<b>171.1</b>	<b>258.0</b>
Indirect Taxes Less Subsidies	12.3	18.9	30.7	47.1
Capital Consumption Allowances and Miscellaneous Valuation Adjust- ments plus Residual Error of Estimate	10.7	14.2	24.0	42.1
<b>GROSS NATIONAL PRODUCT</b>	<b>93.4</b>	<b>141.4</b>	<b>225.8</b>	<b>347.2</b>
<b>PERSONAL INCOME</b>	<b>73.4</b>	<b>112.7</b>	<b>179.2</b>	<b>278.3</b>
<b>PERSONAL DISPOSABLE INCOME</b>	<b>59.3</b>	<b>91.1</b>	<b>142.3</b>	<b>215.1</b>

<sup>1</sup> 1971 Actual, Other Years Forecast.



55	Oil and Natural Gas in Ontario	1967 (continued)	1970 (continued)
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e	The Growth and Development of the Motor Vehicle Industry in Ontario	<b>1968</b>	Jan.-Feb. Tax Reform and Small Business
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ril	"The New Economics" and the Province of Ontario	July-Aug. St. Lawrence Seaway — Impact on Ontario	Mar.-Apr. Ontario's Property Tax Credit Plan
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y	Ontario's New Housing Program	Nov.-Dec. An Analysis of Population Growth Trends in Ontario	Sept.-Oct. An Analysis of Mortality Patterns in Ontario
g.-Sept.	Economic Education		Nov.-Dec. Rates of Return and Taxation from Private Capital in Canada
-Nov.	The Distribution of Personal Income in Ontario and the Ten Economic Regions		
c.	Canada and the U.S. Guidelines		<b>1973</b>
		<b>1970</b>	Jan.-Feb. Fiscal Policy Management and Tax Sharing Reform
7		Jan.-Feb. The Input/Output Structure of the Ontario Economy	Mar.-Apr. Government Reorganization and Treasury, Economics and Inter-governmental Affairs
-Feb.	(Annual Review)	Mar.-Apr. Economic Aspects of Environmental Quality for Ontario	May-June The Canadian Automotive Industry and The 1965 Agreement
r.-Apr.	Fertility and Population Growth in Ontario	May-June The Public Sector and Economic Policy	July-Aug. A Long-Term Economic Forecast for Canada and Ontario
y-June	Soybeans in Ontario: Production, Utilization and Prospects	July-Aug. Design for Development: The Toronto-Centred Region	











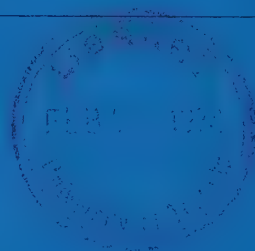


# Ontario Economic Review

September/October 1973  
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Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. John White,  
Minister of Treasury, Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



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## Demographic Trends in Ontario: Some Policy Considerations

D. C. Dallimore and B. Lampert, *Economists*  
Policy Planning Branch

A publication of the  
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### About the Review

The article for the September/October edition of the *Ontario Economic Review* examines some of the major implications which projected demographic trends to the 1980's are likely to have for the development of government policies in Ontario.

Ontario's population, which stood at 7.7 million in 1971, is expected to increase to between 9.3 and 9.9 million by 1986, an annual increase of 1.3 to 1.7 per cent. This is a lower rate of growth than that recorded between 1961 and 1971, when it averaged 2.1 per cent per annum. A significant factor in this reduced rate of population growth is the lower fertility rates forecast for the 1970's than those prevailing in the 1960's. The most unpredictable element in the population increase is migration, about 75 per cent of which is likely to come from abroad.

The article also indicates that the labour force is expected to grow from 3.2 million in 1971 to between 4.3 and 4.5 million by 1981; thereafter, the rate of growth is expected to ease. The proportion of elderly people in the population is expected to increase more rapidly than the population as a whole, while the school-age population is likely to decline. In addition, about 90 per cent of Ontario's population is expected to be living in urban areas by 1986.

These demographic changes have important implications for public expenditures in policy areas such as housing, health, education, employment, and transportation. Some of the major policy considerations are discussed in the article.

The article was prepared by Messrs. D. C. Dallimore and B. Lampert in the Policy Planning Branch, Office of Economic Policy. Particular use was made of "*Ontario Short-Term Population Projections, 1971-1986*", produced by the Economic Analysis Branch, and the authors acknowledge the contribution made by that branch in the drafting of the article.



# Demographic Trends in Ontario: Some Policy Considerations

C. Dallimore and B. Lampert, *Economists*  
Policy Planning Branch

## ARTICLE: TRENDS

### POPULATION

The rate of population increase in Ontario has shown sharp acceleration in the post-war period, reaching a peak of 4.3 per cent in 1957. It dropped between 1961 and 1971 to average 1.6 per cent, and in 1971 the population total was 7,703,105, an increase of only 1.6 per cent since 1970.

The population of Ontario could vary in 1986 from 9.3 million, with a net gain from migration of 30,000 per year (low projection), to 10.9 million, with 60,000 net migration (high projection). This would represent an annual growth rate for the whole population of between 1.3 per cent and 1.7 per cent during the forecast period. These projections are based on a medium fertility assumption which anticipates that the 1971 fertility rate of 2.2 will continue falling at a reduced annual rate, reaching the level of 2.1 by 1986. It is expected that the rate of net migration, which averaged 50,000 per year between 1961 and 1971 and which was estimated to decline to 50,000 in 1971-72, will likely continue higher than the long-term average of 30,000 per year. However, it is not expected to exceed 60,000 per year.

### Fertility

The total fertility rate in Ontario reached a high of 3.8 in 1960 of 3.8, which means that on average each woman produced 3.8 children during her child-bearing years. Since then, fertility rates have declined to about 2.2, so that it is estimated that Ontarians are now only slightly over than reproducing themselves. It is expected that mortality rates will continue the trend of decline shown over the long-run of 50 years, although very slowly, as there appears to be little scope for further reduction. Under present conditions of mortality, a total fertility rate of 2.13 is required to replace the population, excluding the migration factor.

Despite a projected decline in the fertility rate, the number of births per year is expected to increase steadily to 1986. This is a reflection of a steady rise, although at a continuously declining rate, in the number of women in the most fertile age group, 20-29, during the same period. Thus, the effect on population of a decline in fertility per woman will be more than offset by the increased number of women in their early child-bearing years. The forecast decline in fertility rates is likely to be reflected in a decline in average family size from the peak of 3.6 persons reached in 1961 and 1971.

### Migration

This is the most volatile factor in Ontario's population growth and is the most difficult to forecast. It is the net sum of two elements:

- The number of immigrants from abroad to Ontario minus the number of emigrants.
- The number of migrants to Ontario from other provinces minus the number of migrants to other provinces.

During the 20th century, net migration has been responsible for 37.5 per cent of the population growth in Ontario. Clearly, changes in federal immigration and manpower relocation policies can have a tremendous impact. Table I indicates the gain in Ontario's population from migration for each decade of this century. The increase from 1951 to 1971 — 1,292,000 — is particularly noteworthy and represents 62 per cent of all migrants to Ontario between 1901 and 1971.

Table I — Net Migration into Ontario, 1901-1971

Years	Number of Migrants
1901-1911	132,000
1911-1921	110,000
1921-1931	154,000
1931-1941	78,000
1941-1951	305,000
1951-1961	686,000
1961-1971	606,000
<b>Total, 1901-1971</b>	<b>2,071,000</b>

Source: *Net migration into Ontario by decade estimated by Ministry of TE & IA, and based on Census data by Statistics Canada.*

If it is assumed that net migration into Ontario will continue at the 1961-71 annual average rate, a gain to Ontario of 60,000 per year could be expected. This would include some 45,000 from net foreign migration and 15,000 from net inter-provincial migration.

However, the net gain to Ontario of about 60,000 per year may be rather high for a sustained rate over any long period. The growth in the working age population may influence federal immigration policies and result in some reduction in immigration from abroad. Inter-provincial migration is not subject to govern-

mental regulation but is strongly influenced by the levels of economic opportunity in respective provinces. Since the war, Ontario has experienced a large favourable balance in the inter-provincial exchange of migrants, because of continued economic prosperity in the province.

This trend is likely to continue, but at a slower pace, particularly since British Columbia and Alberta have begun to attract increasingly larger proportions of migrants from other provinces. In addition, a changing economic situation in Quebec and the Atlantic Provinces may influence the propensity to migrate among their population. Furthermore, social security, income maintenance, and income redistribution policies could also lessen migratory trends within the country.

Because of the uncertainties inherent in making precise migration forecasts, population projections contained in this article are based on two sets of assumptions concerning migration. One set of projections — the low projection — assumes a net migration of 30,000 per annum; the other — the high projection — assumes net migration of 60,000 per annum.

### Age Distribution

The most noticeable features of the existing and forecast age distribution for Ontario are the relative growth of the young working and the retired population and the declining proportion of school-age groups. The composition of the Ontario population in terms of age groups for 1961 and 1971, together with projections for 1976, 1981, 1986, and 1991, is contained in Table II and illustrated in Figures 1 and 2.

#### 0-4 Age Group

The importance of this group has declined proportionately, due mainly to lower fertility rates. But there should be a modest numerical increase to 1986 because of the relatively large number of women in their early child-bearing years; thereafter, the number of children in this group is expected to decline.

#### 5-19 Age Group

The size of this group is of major importance for educational authorities. Using current demographic trends, the Ministry of Education has projected that school enrolment at elementary level will continue declining to 1982. However, enrolment in secondary schools will likely continue increasing to 1978, when it will begin to decline. Combined elementary and secondary school enrolment is forecast to continue declining to 1982.

Table II Age Distribution of the Ontario Population 1961, 1971 and Projections 1976, 1981, 1986, and 1991

Age Group	1961	1971	Net Migration — 30,000				Net Migration — 60,000			
			1976	1981	1986	1991	1976	1981	1986	1991
			(000's)				(000's)			
0 — 4	740,193	637,260	682	745	785	770	699	772	819	800
5 — 14	1,267,556	1,571,230	1,441	1,351	1,459	1,563	1,465	1,407	1,542	1,600
15 — 19	436,883	713,365	795	799	665	710	804	819	698	700
20 — 29	809,617	1,241,480	1,430	1,567	1,653	1,524	1,480	1,646	1,751	1,600
30 — 54	1,996,932	2,271,765	2,477	2,736	3,047	3,437	2,528	2,864	3,266	3,700
55 — 64	476,748	623,600	689	787	858	858	695	750	879	800
65+	508,073	644,405	708	795	881	1,006	713	805	899	1,000
<b>Total</b>	<b>6,236,092</b>	<b>7,703,105</b>	<b>8,222</b>	<b>8,780</b>	<b>9,348</b>	<b>9,868</b>	<b>8,384</b>	<b>9,112</b>	<b>9,854</b>	<b>10,500</b>

Note: The projections are based on a medium fertility assumption.

Source: SC, Census of Canada, 1961 and 1971.

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.

### 20-64 Age Group

The size of the 20-64 age group, the bulk of the population from which the labour force is drawn, is forecast to continue to increase significantly to 1986. The 20-29 age group is crucial in terms of family formation. This group numbered 1,241,480, or 16.1 per cent of the population, in 1971 and is forecast to grow to between 1,653,000 and 1,751,000 (17.7 per cent) by 1986. Consequently, there is expected to be an increase in household formation.<sup>1</sup>

Non-family household formation has become an increasingly important segment of total housing demand. The ratio of non-family households to the total number of households has increased steadily over the past ten years, from 13.3 per cent in 1961 to 18.1 per cent in 1971. This increase can be expected to continue at a declining rate over the forecast period.

### 65 and Over Age Group

While improvements in life expectancy, especially for females, are aiding the growth in the proportion of the older population, the trend has been moderated by large numbers of immigrants who are in the young working and family formation age groups. When immigration is low, there is a tendency for a higher proportion of the total population to be in the 65 and over age group. In 1971, 644,405 persons, or 8.4 per cent of Ontario's population, were 65 and over. This age group is forecast to

grow to over 9 per cent by 1986 and to almost 11 per cent by 2001. Consequently, a significant demographic trend is that the number of people aged 65 and over will increase more rapidly than the population as a whole.

### "Dependent Population"

The "dependent" population is defined as the non-working element of the total population. The concept of a dependent population is not static because there is an increasing tendency for people to move between the labour force and academic studies and raise children during their lifetimes. However, the working population aged 14-64 constitutes the main group forming the "independent" population contributing to economic support.

The fertility rate is expected to continue declining, while the population is forecast to increase at an average annual rate of between 1.3 and 1.7 per cent from 1971 to 1986. Table III illustrates, in terms of the population dependency ratio, the trends to relatively fewer young people and significantly more elderly people. Thus, in 1971 the total number of people in the non-working dependent population was 4,454,000, while those in the working independent population numbered 3,249,000. The dependent population was therefore 137 for every 100 persons in the labour force. This is forecast to decline to about 103 in 1981 and 100 in 1986, mainly

because of anticipated low fertility rates and the large number of people born in the 1950s and early 1960's who will be reaching working age. Therefore, the dependency burden of an increasing number of people in the dependent population will be more than offset by the significant increase in the independent population over the forecast period.

### II — LABOUR FORCE

The number of people in the labour force at any point is determined by the size of the working age population (people 14 years of age and over) and the participation rates. Over the past 25 years, the Ontario labour force has been growing at an annual rate of 2.5 per cent. This rate of increase was mainly the result of a larger than average number of new entrants to the work force, large numbers of immigrants to Ontario from abroad and migrants from other provinces, and a substantial increase in participation rates for women.

The future growth of the labour force will be determined by:

- Population growth and changes in the structure of the population. These are a function of expected fertility rates and the level of migration.
- Future trends in participation rates, which are influenced by the level of economic activity, attitudes to work and leisure, and retirement trends.

The high proportion of the population



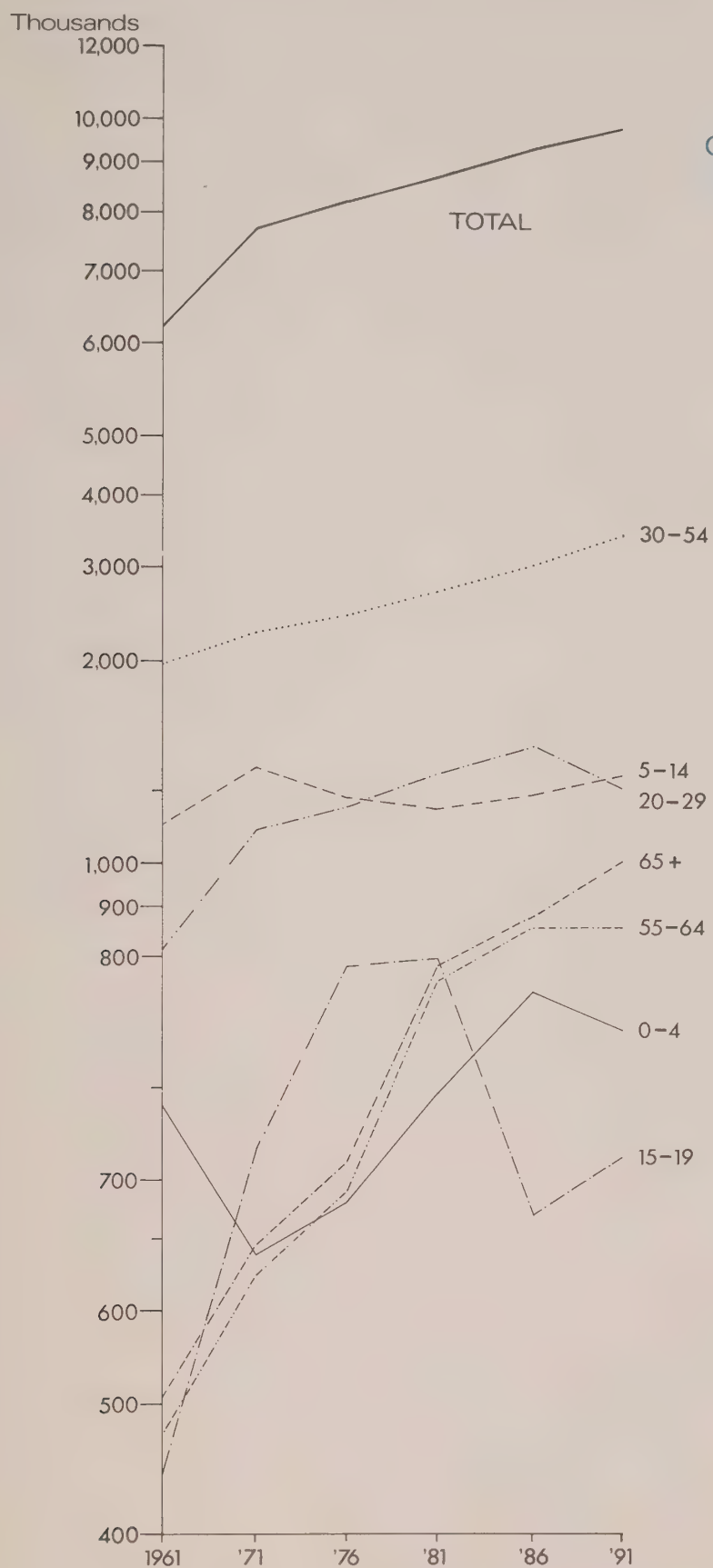


FIGURE 1  
Ontario Population Growth  
By Specified Age Groups  
1961-1991  
(Low Projection)

Source: SC, Census of Canada, 1961 and 1971.

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.

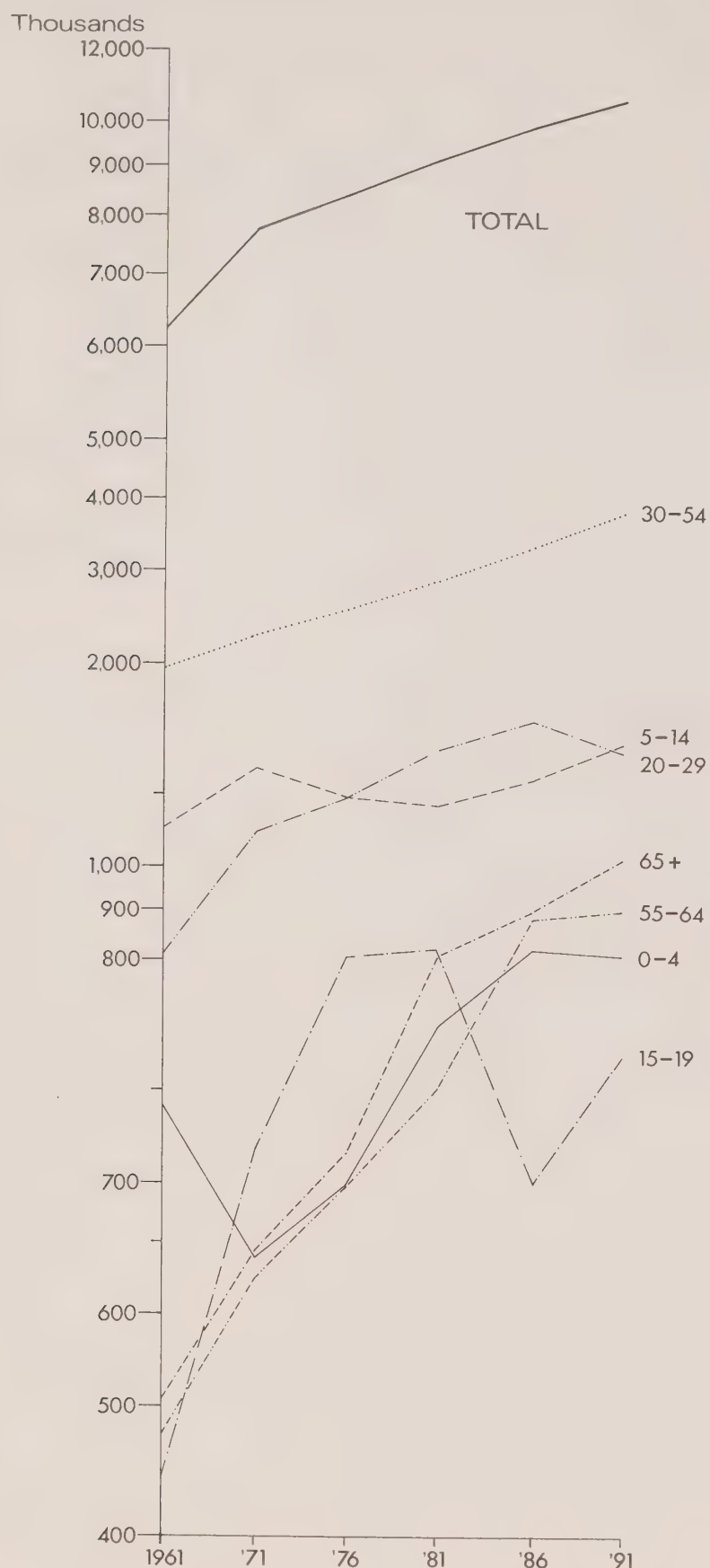


FIGURE 2  
Ontario Population Growth  
By Specified Age Groups  
1961-1991  
(High Projection)

Source: SC, Census of Canada, 1961 and 1971.

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.



Table III — The Dependency Ratio of the Non-Working Population, Ontario, 1971-1986  
(100 Persons in the Labour Force)

Group	Actual 1971	High Projection (60,000 Migration)			Low Projection (30,000 Migration)		
		1976	1981	1986	1976	1981	1986
Non-Working Population (000's)							
Under 14	2,056	2,001	2,037	2,216	1,960	1,958	2,109
14 — 64	1,830	1,925	1,898	1,928	1,883	1,835	1,824
65+	568	612	692	774	609	683	758
Total	4,454	4,538	4,627	4,918	4,452	4,476	4,691
Working Population (000's)							
14 — 64	3,173	3,745	4,371	4,810	3,670	4,192	4,535
65+	76	101	113	125	99	112	123
Total	3,249	3,846	4,484	4,935	3,769	4,304	4,658
Dependency Ratio	137	118	103	100	118	104	101

Source: These projections are based on a medium fertility assumption. Dependency ratio refers to number of persons outside the labour force per 100 persons in the labour force.

Source: SC, Census of Canada, 1971.

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.

in the 15-24 age group (almost 24 per cent) assures a heavy inflow of people into the labour force over the next ten years. This inflow will ease off in the early 1980's as the effect of the lower birth rates of the 1960's is

#### Migration

Migration has a significant impact on labour force growth and has provided approximately 50 per cent of the total increase in the Ontario labour force over the past 25 years. However, Ontario may not be the recipient of large-scale migration in the 1970's as the domestic supply of workers may well prove to be adequate for the needs of the economy. Reflecting that labour force projections are based on two sets of net migration; one set of projections assumes migration of 30,000, while the other assumes migration will be 60,000 persons per year. These projections are derived from an econometric model<sup>2</sup> of the Canadian economy which provides an indication of the pace of overall economic activity. This is the basis for forecasting labour force numbers in Ontario.<sup>3</sup> As is shown in Table IV, Ontario's labour force is expected to grow from 3.2 million in 1971 to between 4.3 and 4.5 million by 1981; thereafter, the rate of growth is expected to slow. The main factors contributing to this

easing are the reduced rate of increase in the inflow of young persons into the working-age population and the slackening in the growth of female participation rates.

The sensitivity of labour force growth to levels of migration is illustrated in Table V. The annual difference in levels of migration assumed for the projections (60,000 minus 30,000) would correspond with an increase in the labour force of 180,000 at the end of the ten-year period 1971-1981, and with an increase of 277,000 by 1986. This indicates the contribution which migration can make to labour force growth in Ontario.

#### Participation Rates

Changing attitudes to education can have a significant effect on labour force participation rates. The contention that education is a continuing process, not limited to the early years of adulthood, is gaining acceptance. The number of students in the 14-24 age group who will decide to postpone their education thus remains an imponderable. Table VI represents an attempt to estimate how these various trends will offset each other.

Participation rates to 1976 imply that significantly fewer males aged 14-19 are expected to join the labour force. This downward trend is expected to continue, more slowly, to 1986.

Participation rates for males in the 20-24 age group, however, are projected to increase gradually to 1986 because students are increasingly likely to spend some part of their early twenties in full time employment before completing their higher education.

The trends in prospect for women are more noteworthy. For female age groups between 20 and 64, very substantial gains in participation are expected, as it seems likely there will be an increase in the attractiveness and availability of part-time and temporary work. However, as Table VI indicates, a deceleration in the growth rate of female participation during the 1980's is anticipated. Participation rates depend on social and economic factors as well as demographic trends, rendering forecasting into the 1980's increasingly difficult.

#### Labour Force Growth

While labour force growth accelerated at an annual rate of 3.1 per cent in the 1960's, it is expected to decelerate throughout most of the 1970's. Based on medium fertility rates and on trends in participation rates, the high migration projection implies an annual rate of labour force growth of 3.3 per cent in the 1970's; the low migration projection indicates an annual rate of labour force growth of 2.9 per cent during the same period. Moreover, the size of

Table IV – Labour Force Growth in Ontario,<sup>1</sup> 1961-1986

Year	Males		Females		Total	
	Number (000's)	Annual Growth Rate (per cent)	Number (000's)	Annual Growth Rate (per cent)	Number (000's)	Annual Growth (per cent)
1961	1,717		684		2,401	
1966	1,869	1.7	850	4.4	2,719	2.5
1971	2,138	2.7	1,111	5.5	3,249	3.6
High						
Projection (60,000 net migration)						
1976	2,477	3.0	1,369	4.3	3,846	3.4
1981	2,775	2.3	1,709	4.5	4,484	3.1
1986	3,043	1.9	1,892	2.1	4,935	1.9
Low						
Projection (30,000 net migration)						
1976	2,426	2.6	1,343	3.9	3,769	3.0
1981	2,665	1.9	1,639	4.1	4,304	2.7
1986	2,873	1.5	1,785	1.7	4,658	1.6

(1) – 14 years and over

Note: These projections are based on a medium fertility assumption.

Source: SC, The Labour Force Survey, 1961, 1966, and 1971 (Special Tabulations)

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.

the population base and the size of the economy in the late 1970's will be significantly larger than those at any previous time. After 1981, the rate of growth of the labour force is expected to ease.

As illustrated in Figures 3 and 4, the 25-34 labour force group (numbering 733,000 in 1971) will continue to be by far the largest element in the labour force in the forecast period, reaching between 1,200,000 and 1,300,000 by 1986. The 35-44 age group in 1971 was the second largest component of the labour force (695,000) and is expected to maintain this position, growing to between 1,040,000 and 1,125,000 by 1986. When these two groups are combined, the 25-44 age group of the labour force formed 44 per cent of the total in 1971, and it is anticipated that this figure will rise to about 50 per cent by 1986.

Since the trend towards increased education is likely to continue, the labour force will be better educated and more mobile. Therefore, greater flexibility in the labour supply in terms of spatial and occupational mobility within the province is anticipated. However, structural problems may also persist because of the heavy inflow into the labour force of inexperienced young people whose training does not always match job requirements.

#### Early Retirement

It is difficult to generalize about the impact of

Table V – Ontario Labour Force Projections for Alternative Migration Assumptions, 1971-1986 (000's)

Year	Actual	Labour Force		
		High	Low	Difference
1971	3,249			
1976		3,846	3,769	77
1981		4,484	4,304	180
1986		4,935	4,658	277

Note: These projections are based on a medium fertility assumption.

Source: SC, The Labour Force Survey, 1971 (Special Tabulations).

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.

early retirement on the Ontario economy for lack of adequate statistics. One problem is that older workers in some businesses find employment after retirement; another, that not all workers retire automatically at age 60 or 65. Almost 21 per cent of males aged 65 and over were still working in 1971, and this proportion is expected to increase to 25 per cent during the forecast period.

#### Changing Attitudes Towards Work and Leisure

Participation in the work force is influenced by

the level of economic activity as well as of factors related to people's attitudes to work and leisure, and so on. There has been increased debate about the work ethic and attitudes towards work, and workers and unions are showing marked interest in larger blocks of leisure time.

Recently, there has been growing support for the restructuring or shortening of the work week. By 1986, a larger proportion of the labour force is likely to be on a four-day work week, ranging between 36 and 32 hours.



FIGURE 3 - Age Distribution of the Ontario Labour Force 1971 and Low Projections 1976, 1981, 1986, 1991

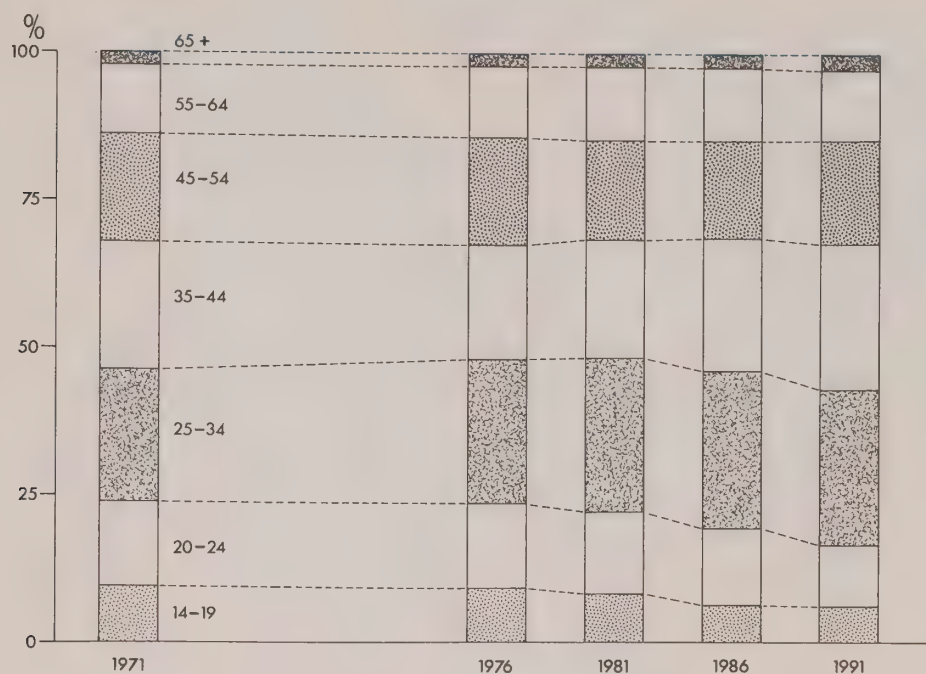


FIGURE 4 - Age Distribution of the Ontario Labour Force 1971 and High Projections 1976, 1981, 1986, 1991

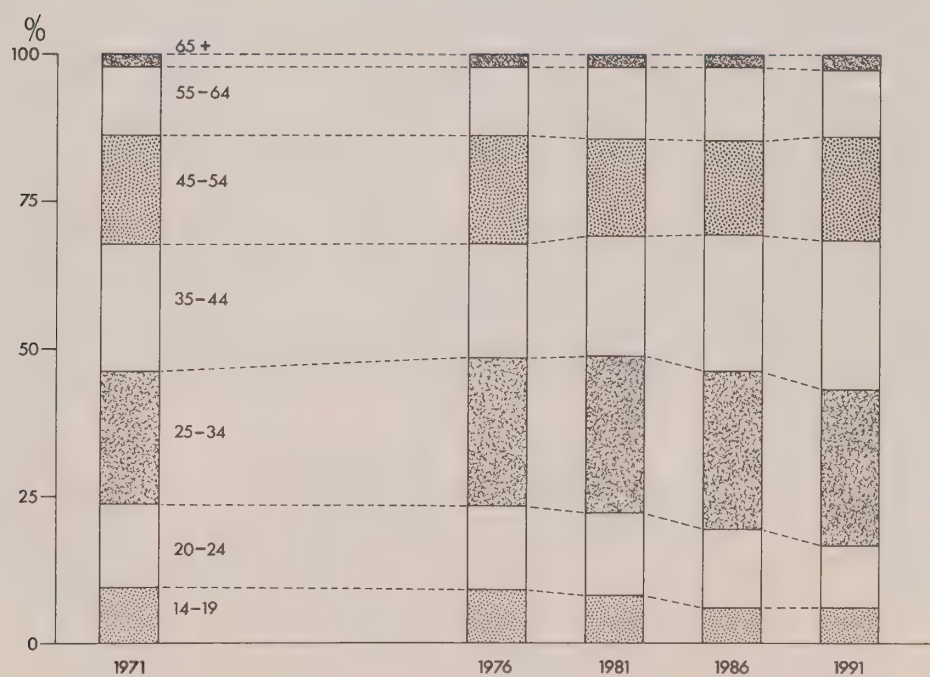


Table VI – Ontario Labour Force Participation Rates, by Age Group and Sex, 1961-1986  
(per cent)

Year	14-19	20-24	25-34	35-44	45-54	55-64
Males						
1961 <sup>(1)</sup>	40.6	89.0	95.7	96.0	94.2	84.5
1971	47.2	79.4	94.8	98.5	96.4	85.5
Projected Rates						
1976	42.0	82.0	97.0	98.0	96.0	88.0
1981	41.5	84.0	97.0	98.0	96.0	88.0
1986	41.0	84.5	97.0	98.0	96.0	88.0
Females						
1961 <sup>(1)</sup>	33.9	51.6	33.8	36.2	38.4	28.4
1971	40.7	55.7	44.9	47.7	46.1	34.6
Projected Rates						
1976	42.0	58.5	46.0	50.0	51.0	40.0
1981	41.5	66.0	52.0	57.0	59.0	48.0
1986	41.0	67.5	52.5	59.0	62.0	50.0

<sup>(1)</sup> 15-19 Year Age Group

Source: DBS, Census of Canada, 1961 (*Population and Labour Force, Volume III, Part I*)  
SC, The Labour Force Survey, 1971. (*Special Tabulations*).

Projections by Ministry of Treasury, Economics and Intergovernmental Affairs.

### III – SPATIAL DISTRIBUTION

The majority of Ontario's population in 1971 was classified as urban.<sup>4</sup> Table VII illustrates the growth of urban population between 1961 and 1971.

If the trend between 1961 and 1971 is maintained, about 90 per cent of Ontario's population could be classified as urban by 1986, with the urban population growing at a faster rate than that of the total population. This shift from a rural to an urban population is related to the growth of the industrial economy and to net migration from abroad and other parts of Canada.

Ontario, with 82.4 per cent of its population classified as urban in 1971, is the most urbanized province. In the same year 76.1 per cent of Canada's population was classified as urban and 80.6 per cent of Quebec's population was similarly classed. The Economic Council of Canada<sup>5</sup> forecasts that over 80 per cent of Canada's population will be urban by 1980. The ECC also expects that about 60 per cent of the population will be concentrated in 29

Table VII – Ontario's Population Distribution, 1961-1971

	Rural		Urban		Total
		Per Cent		Per Cent	
1961	1,412,563	22.7	4,823,529	77.3	6,236,092
1966	1,367,430	19.6	5,593,440	80.4	6,960,870
1971	1,359,475	17.6	6,343,630	82.4	7,703,105

Source: SC, Census of Canada, 1961, 1966, and 1971.

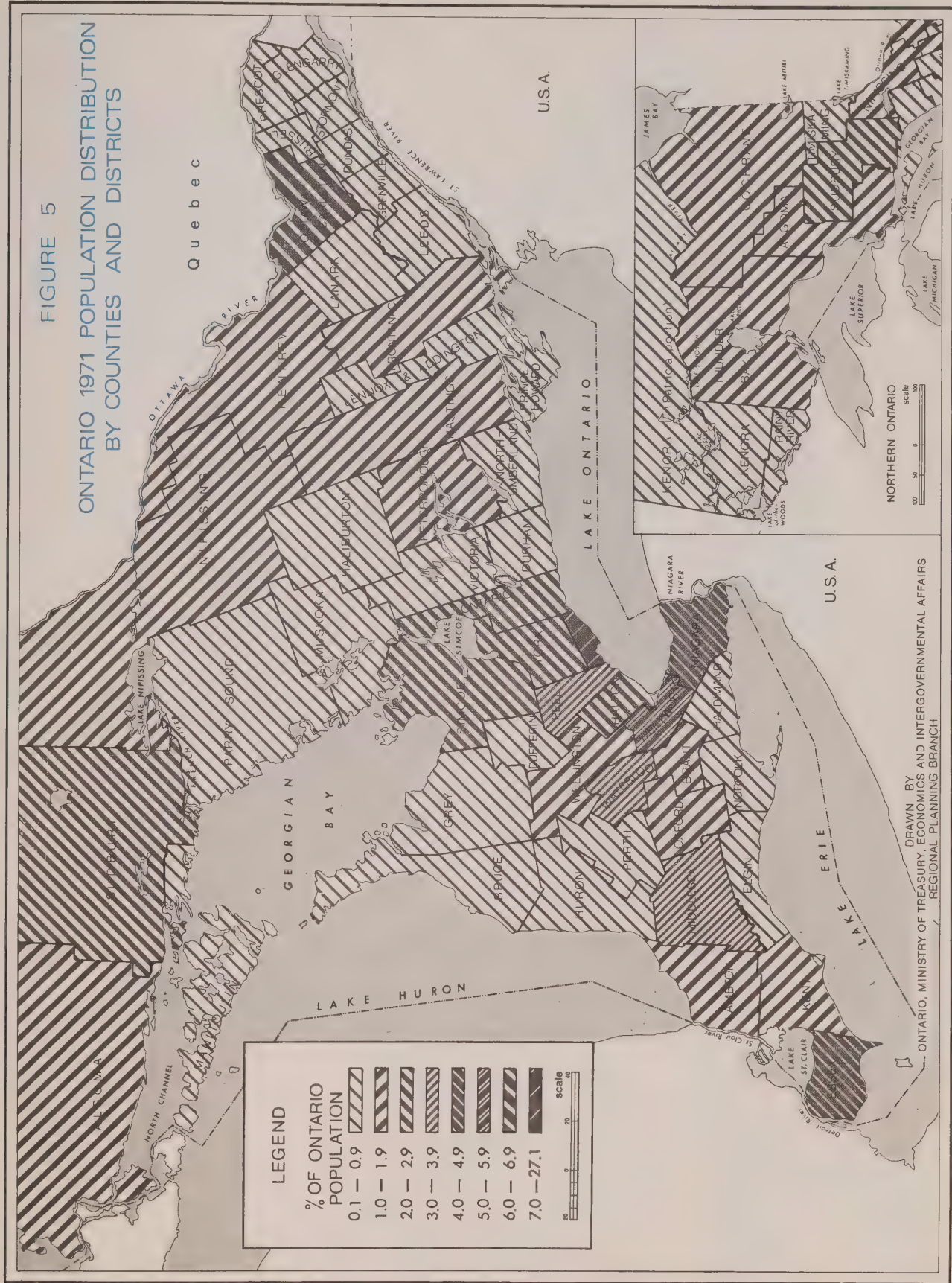
urban complexes, each with a population of at least 100,000.

The concentration of Ontario's population in the southern part of the province and along the Windsor-Montreal corridor (the line of Highway 401) is expected to continue. In 1961, 3.4 million, 54 per cent of the Province's population, was located in 21 centres along this corridor; by 1971, this had grown to 4.5 million, 58 per cent of the Province's population. Given

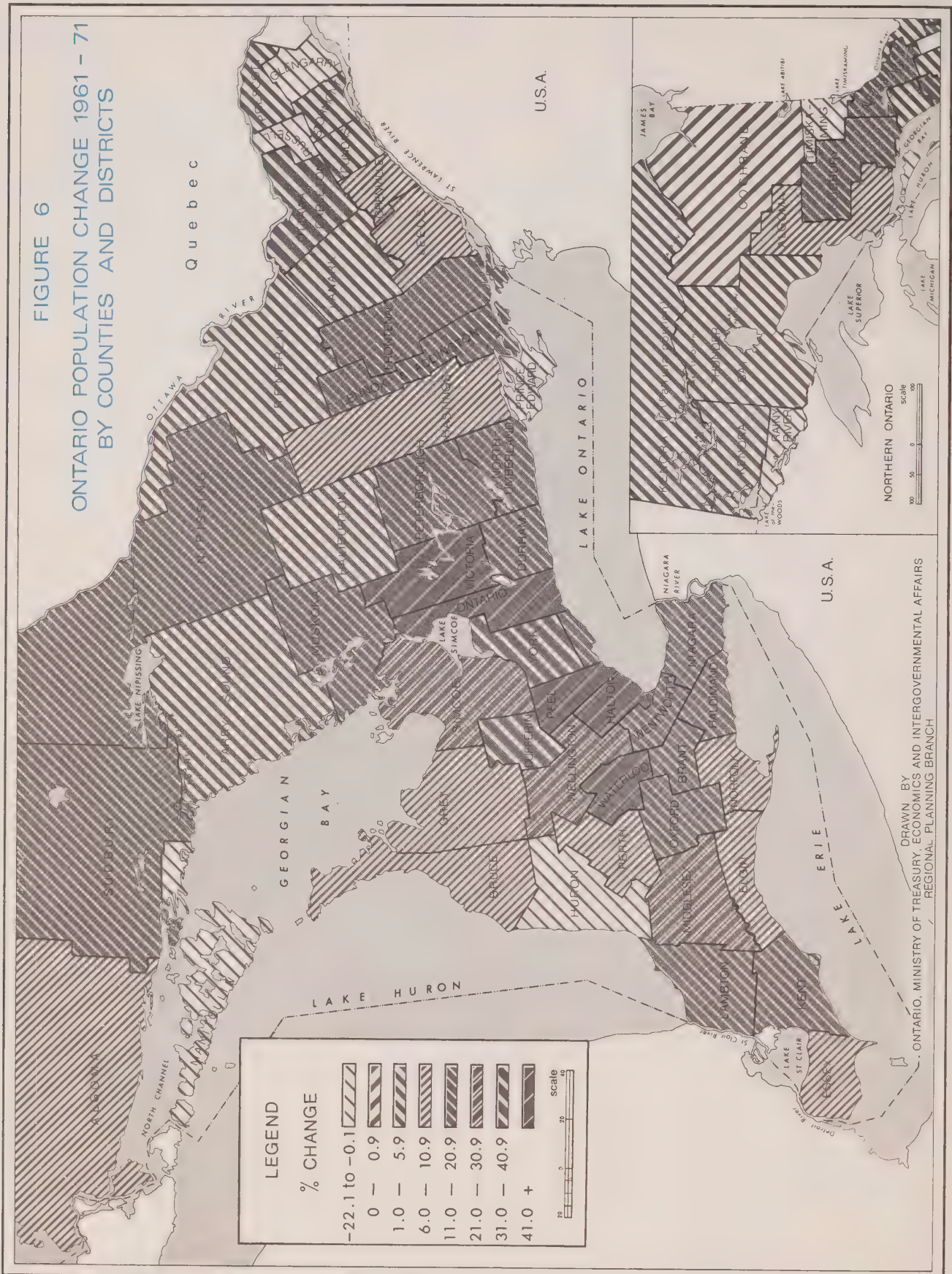
such trends, by 1981 these centres could grow to 6.9 million, or about 67 per cent of the provincial total. In contrast, Northern Ontario's portion of the total provincial population is declining, having fallen from 11.6 per cent in 1961 to 10.1 per cent (or 776,505) in 1971. Figure 5 illustrates the distribution of Ontario's population in 1971; Figure 6 shows population changes by county and district between 1961 and 1971.



FIGURE 5  
ONTARIO 1971 POPULATION DISTRIBUTION  
BY COUNTIES AND DISTRICTS









## ART II: SOME POLICY CONSIDERATIONS

projected changes in Ontario's population composition and distribution could have important implications for priorities in terms of government policies and expenditures. Some of these are discussed below.

### Migration

In the area of immigration where the great uncertainty in forecasting the future size of the population lies. Changes in federal immigration policy have considerable ramifications for provincial policies; for example, if immigration is restricted, this would likely reduce the rate of population growth in the Metropolitan Toronto area. Over half of all immigrants to Ontario from abroad settle in Toronto and in the last few years Toronto has been receiving an annual average of at least 40,000 immigrants.<sup>6</sup> Immigration in the past enabled Canada, and particularly Ontario, to rapidly assimilate skilled labour and professionals, although the training and development of skills within the province during the last two decades could lessen the dependence on immigration for this purpose in the future.

Population increases attributable to migration have particular repercussions on levels of employment, public and private investment, household formation, housing construction, and education requirements in the province. More specifically, immigration has had and will continue to have a marked effect on population growth in larger Ontario cities since the majority of immigrants settle in urban areas where jobs and housing are more likely to be available.

### Education

During the past few years, expenditure in education has absorbed a large percentage of provincial wealth. Massive spending by the provincial and municipal governments to provide for basic public school education has been necessitated by the large proportion of young people of elementary and secondary school age. In addition, the increasing number of years of schooling needed in a technologically advanced economy and the increased desire to provide a quality of educational opportunities have contributed to the higher cost of education. There may now be some easing in the demographic pressures which resulted in the increasingly high resource allocations for education.

With shifts in population within Ontario disintegrated, the stock of relatively new educational capital already provided will probably be

adequate to meet most demands at the elementary and junior school levels for some years. There will be continued but reduced pressure on secondary school facilities. To a large extent, additional construction of educational facilities will most likely be associated with migration within Ontario and replacement of obsolete buildings.

Observing current enrolment trends, the Ministry of Colleges and Universities projects that overall enrolment at post-secondary educational institutions will increase fairly slowly at least to 1975, that university enrolment will show little growth, and that enrolment at the Colleges of Applied Arts and Technology will constitute the bulk of the increase. This will have significant implications for investment and teacher expenditures in the area of post-secondary education.

### Household Formation

The 20-29 age group, the most important in terms of family formation, is forecast to increase by about half a million between 1971 and 1986, with its share of the total Ontario population growing from 16.1 to 17.7 per cent. Consequently, household formation is expected to increase, leading to increased demand for houses and associated consumer durables. A large proportion of immigrants fall in this age group and would, therefore, influence this trend.

### Elderly Population

The relative decline in the 0-14 age group indicates that budgetary demands, in terms of the provision of educational facilities, may ease. However, the increase in the 65 and over age group is expected to grow more quickly than the population as a whole. This suggests that government expenditures on this group will likely increase and perhaps more than offset those for the school-age population. Nevertheless, as indicated earlier, the overall dependency burden of the increasing size of the non-working population is expected to be more than offset by the more rapid growth of the working population. In addition, immigration from abroad can help to counterbalance the financial impact of a rising elderly population, because immigration has a positive effect on the working and family formation age groups. Thus, when immigration is high, the number of people 65 years and over tend to form a lower proportion of the total population.

Therefore, the growth of the 65 and over age group will likely involve an increase in federal government transfer payments, such as the old

age pension and the guaranteed income supplement. Provincial government expenditures on such items as the provision of senior citizens' housing, institutional care, and geriatric health facilities, will also rise.

### Manpower and Employment

Greater flexibility is anticipated in terms of spatial and occupational mobility within the province, as a result of a better educated and more mobile labour force.

There is expected to be a continuing need for special employment programs to alleviate structural problems, which may also persist because of the heavy influx of relatively inexperienced labour force entrants whose training does not always match job requirements. The integration of these programs with manpower training schemes is essential to ensure a more adaptable labour force, responsive to the needs of the economy.

Job creation should remain a major consideration in the near term, although the expected easing in the growth of the labour force after 1981 could contribute to a reduction in the pressure for new jobs in the early 1980's.

Since labour force growth in the future is expected to rely more heavily on the domestic population than on immigration, it may be more difficult to find suitable employment opportunities for new labour force participants. The attainment of a comparable level of employment with a largely domestic growth in the labour force could be more expensive in terms of manpower training. It must be remembered, however, that inflows of people from outside of the province also impose demands on social services, which require the provision of additional "social overhead capital" in the form of schools, health facilities, housing, public utilities, and water and sewage systems.

While the continued shortening and/or restructuring of the work week might increase employee morale, it could contribute to a lowering of productivity. In addition, a change in the work week will impinge on the problems of urbanization, the environment, and the use of leisure time. However, to accommodate a more flexible work week, it may be necessary to review federal and provincial labour legislation. Meanwhile, the Ontario Government has undertaken a demonstration project with more flexible work schedules in the Queen's Park administrative complex in Toronto to relieve pressure on the transportation system.

The recent trend to a reduction in working hours and the associated boom in leisure industries are creating new jobs in almost every sec-

tor of the economy; furthermore, this impact is likely to result in continuing high levels of public expenditures on parkland, water facilities, highways, secondary roads, and bridges. This will occur at a time when there is increasing pressure for the use of land.

### Urban Growth

Urban growth is sensitive to population movement, and trends in migration are a key factor in influencing the size and characteristics of Ontario cities. The outlook for the future is the further general concentration of population along the Windsor-Montreal corridor and particularly within the Toronto-Centred Region. One forecast,<sup>7</sup> for example, suggests that by the year 2000 Metropolitan Toronto could double or treble its 1966 population to reach 4 or 6 million. This would arise out of economic pressures and preferences of the population to live in an urban area.

Whatever the magnitude of such a population increase, the growth of urban population is creating pressures on the nature and quality of land use in urban areas — especially in and around Metropolitan Toronto. This population pressure has contributed to a growth in land and house prices, which have risen faster than personal incomes. Thus, on average, whereas net personal disposable incomes<sup>8</sup> per household in twelve selected urban areas of Ontario rose by 64.1 per cent between 1961 and 1971, the cost of new detached NHA homes rose by 86.5 per cent, and the cost of new NHA lots rose by 189 per cent.

Because of the intense pressure on urban centres, there will be a need for more imaginative and innovative policies on the part of both the public and private sectors to provide adequate, economically priced housing. The Province has taken a number of measures to counteract the upward cost pressures. A new Minis-

try of Housing has been established and various initiatives have been taken to increase the availability of serviced land in major urban centres. In addition, there has been a determined effort to redistribute growth more evenly in Southern Ontario. The Toronto-Centred Region Plan represents an attempt to structure the growth of the greater Toronto area into an orderly system of urban communities incorporating a park belt.

The possibilities for controlling urban growth include co-ordination of regional development with industrial and agricultural policies, limitations on urban sprawl, integration of land use, regional and transportation planning, and the development of fully planned communities. Perhaps, however, there is a need for a more comprehensive Ontario-wide policy for population distribution linked with the physical and economic aspects of the planning of the province.

<sup>1</sup> The principal components of household formation are family household formation and non-family household formation.

<sup>2</sup> For detail, see Dr. Clifford Jutlah's "A Long-Term Economic Forecast for Canada and Ontario", Ontario Economic Review, Vol. 11, No. 4 (Toronto: Queen's Printer, 1973).

<sup>3</sup> The 1971 Ontario labour force figure is based on the 1971 Labour Force Survey rather than the 1971 Census.

<sup>4</sup> Urban population consists of all people residing in communities with a population of at least 1,000.

<sup>5</sup> Economic Council of Canada, "The Canadian Economy From the 1960's to the 1970's," Fourth Annual Review (Ottawa: Queen's Printer, 1967).

<sup>6</sup> Freda Hawkins, "Canada and Immigration: A Policy and Public Concern" (Montreal: the Institute of Public Administration of Canada, 1972).

<sup>7</sup> Systems Research Group: "Canada: Population Projections to the Year 2000" (Toronto, 1970).

<sup>8</sup> Personal disposable income is generally equivalent to "effective buying income" as defined in Management's "Survey of Buying Power", 1962, pp. 714-718; and July 1972, pp. E28-E29.











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Ministry of Treasury, Economics and Intergovernmental Affairs

Hon. John White,  
Minister of Treasury, Economics and Intergovernmental Affairs  
H. Ian Macdonald, Deputy Minister



# Ontario Economic Review

November/December 1973

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## The Future Structure of Ontario's Economy

Enedina Ferik and J. P. Warner, *Economists*

Policy Planning Branch

## The Economic Impact of the Mackenzie Valley Gas Pipeline Project

R. G. Fletcher, *Economist*

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## Selected Economic Indicators

1

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Hon. John White  
*Minister of Treasury, Economics  
and Intergovernmental Affairs*

H. Ian Macdonald  
*Deputy Minister*

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### About the Review

The proposal to construct a 2,500-mile pipeline to carry natural gas from the Mackenzie Delta and from Prudhoe Bay in Alaska to markets in Canada and the United States is the largest project ever proposed in Canada by the private sector. It is not surprising then, that a project of the size of the Mackenzie Valley Gas Pipeline should produce considerable concern regarding its implications for the Canadian economy.

The feature article for the November/December edition of the *Ontario Economic Review* examines some of the issues that have been raised in connection with the construction of the pipeline. With the aid of an econometric model, the extent and timing of the impacts are traced out in terms of interest rates, inflation, balance of payments, the exchange value of the Canadian dollar, employment, and GNP.

No attempt is made to answer the question whether the pipeline should be built, but only what the impact will likely be and what economic problems are likely to arise if construction proceeds. The article was prepared by R. G. Fletcher in the Policy Planning Branch, Office of Economic Policy, Ministry of Treasury, Economics and Intergovernmental Affairs.

In an article on the structure of the Ontario economy in the mid-1980's, Enedina Ferik and J. P. Warner of the Policy Planning Branch look at the growth of the manufacturing and service sectors of the economy and project to 1985 the distribution of employment by sector in Ontario.

Just as agriculture now employs fewer persons than it did at the turn of the century, so the manufacturing and service sectors of the economy can be expected to assume new relative positions in the future.

### Indicator Charts, Pages 14-16

Fluctuations in aggregate economic activity — commonly used to define business cycles — do not necessarily correspond with fluctuations in the individual activities which make up the aggregate. Instead different indicators of economic activity may vary with respect to both their rates of growth and the timing of their peaks and troughs: some may grow more rapidly than others, some change direction sooner.

Those activities which tend to assume a direction in advance of the aggregate — because they relate to future rather than present production — are referred to as leading indicators, and are widely used to anticipate the short-run future course of the overall economy. The charts on pages 14, 15 and 16 in the *Ontario Economic Review* present a number of these leading indicators, as well as several which are coincidental to or lag behind the aggregate, to provide for the reader an opportunity to make such an evaluation.

While comparisons of the timing and direction of general changes in the various indicators can readily be made, great care must be exercised in making such a comparison of the amplitude of fluctuations. Of the three vertical scales used — 'A' (arithmetic) and 'L1' and 'L2' (logarithmic scales with one and two cycles respectively over a given vertical distance) — only the logarithmic scales can be used to compare relative changes in different indicators. *And this applies only when all series being compared are on the same logarithmic scale.* In such a situation all parallel lines represent equal rates of growth, the exact rate of growth being determined by the slope of the line.



# The Future Structure of Ontario's Economy

dina Ferik and J. P. Warner, *Economists*  
 cy Planning Branch

## INTRODUCTION

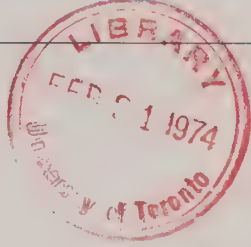
There are two ways of describing the industrial structure of an economy. The first method is based on the distribution of employment among the various industries. The second focuses upon the contribution each industry makes to real domestic product. By both measures, Ontario's post-war economic development has brought significant shifts in its industrial structure. The trend in Ontario, as in Canada and in industrialized countries in general, has been a decline in employment in agriculture. The relative importance of the manufacturing sector and of the service industries depends upon the criteria used, but employment in the latter has grown very rapidly.

A tentative view of the future structure of Ontario's economy was obtained by projecting output to 1985 on the basis of rates actually experienced in Ontario during the period 1961-1970.<sup>1</sup> Employment in 1985 was estimated on the projected output, using three possible productivity trends.

## BACKGROUND

Ontario's economy is dominated by the manufacturing sector. It is the Province's biggest employer and provided 27 per cent of all jobs in 1972. Its relative importance as the major source of employment, however, has been diminishing, as Table I illustrates. While manufacturing still accounted for 28 per cent of provincial employment in 1961, the proportion was 32 per cent a decade earlier. On the other hand, the growing importance of the service-producing sector is highlighted by the fact that in 1972 it employed 61 per cent of the total work force, as compared with 56 per cent in 1961, and 48 per cent in 1951. Within the service sector, community, business and personal services showed the greatest growth in employment and accounted for 51 per cent of the total increase in employment in the sector during the 1951-1972 period. Declines in employment were experienced in all the primary industries, particularly in agriculture. Another way of viewing the structure of an economy is to look at the proportion of total output contributed by each industry. Table II shows that the manufacturing sector accounted for 34 per cent of the total provincial output in 1970, as compared with 31 per cent in 1961, while primary industries now contribute less to the provincial economy. The service sector of the economy generated almost 56 per cent of the total output in 1970, down slightly from 49 per cent in 1961.

Table I – Distribution of Employment in Ontario, 1951, 1961, 1972  
 (per cent)



	1951	1961	1972
Goods-producing Sector	52.5	44.0	38.6
Agriculture	10.8	7.2	3.6
Other Primary	3.0	2.7	1.8
Manufacturing	32.4	27.5	27.4
Construction	6.3	6.6	5.8
Service-producing Sector	47.5	56.0	61.4
Transportation, Communication and Other Utilities	9.0	8.3	7.6
Trade	14.6	15.8	16.4
Finance, Insurance and Real Estate	3.3	4.2	5.1
Community, Business and Personal Service	14.4	20.0	25.5
Public Administration and Defense	6.2	7.7	6.8
TOTAL	100.0	100.0	100.0

Source: Distribution is based on statistics from Census of Canada and The Labour Force Survey, Statistics Canada.

Table II – Distribution of Output in Ontario, 1961 and 1970  
 (per cent)

	1961	1970
Goods-producing Sector	43.1	44.2
Agriculture	3.5	2.5
Other Primary	3.9	2.9
Manufacturing	30.9	34.0
Construction	4.8	4.8
Service-producing Sector	56.9	55.8
Transportation, Communication and Other Utilities	10.6	11.5
Trade	12.8	13.0
Finance, Insurance and Real Estate	13.3	11.3
Community, Business and Personal Service	12.7	14.1
Public Administration and Defense	7.5	5.9
TOTAL	100.0	100.0

Note: 1961 weights of real gross domestic product are used.

Source: Estimates of real domestic product were made by the Ministry of Treasury, Economics and Intergovernmental Affairs.

## III – FUTURE STRUCTURE

Changes in the industrial structure of the economy are determined by the relative rates of growth of output and of labour productivity. Since forecasting the productivity gain of a particular industry is hazardous, three sources of real output per unit of labour input have been used to obtain a range of forecasts:

- United States trends for the period 1948-1969 inclusive.<sup>2</sup>
- Projections for Canada for the period 1970-1980 by the Economic Council of Canada.<sup>3</sup>
- Projections of the productivity of Ontario industries prepared by the Ministry of Treasury, Economics and Intergovernmental Affairs.



Figures for the principal industrial sectors are listed in Table III. The United States and the Economic Council of Canada figures are expressed in terms of real output per man-hour, while those of TE & IA are expressed as real output per employee.

Table IV shows the alternative employment patterns in 1985, calculated on the basis of the three productivity trends and the projected output for Ontario.

These employment figures suggest that manufacturing will provide jobs for a smaller proportion of the work force in the future. According to these forecasts, most of the additional employment will be in the service-producing sector, mainly in community, business and personal services. The goods-producing industries in 1985 will provide jobs for little more than one-third of the working population in Ontario.

The total employment forecast for 1985 derived from these productivity figures also provides some indication as to the amount of latitude that may exist in the labour market at

**Table III – Productivity Trends**  
(Average annual percentage increase)

	Output per man-hour		Output per employee
	U.S. 1948-69	ECC 1970-80	TE & IA 1970-90
Agriculture	5.7	5.0	5.7
Forestry	—	5.3	3.8
Mining	3.8	3.9	4.8
Manufacturing	3.0	5.6	3.2
Utilities	5.9	7.8	4.2
Construction	1.3	2.8	3.0
Transportation	3.2		3.5
Communication	5.4	4.6	4.4
Trade	2.6	3.5	1.6
Finance, Insurance and Real Estate	1.9	1.7	1.1
Services	1.1	1.5	1.5
Public Administration and Defence	—	0.0	.9

Source: Projections by the ECC, by TE & IA, and by J. W. Kendrick.

**Table IV – Industrial Structure, Ontario, 1985**

	OUTPUT  Real Domestic Product (per cent)	EMPLOYMENT (three productivity projections) <sup>2</sup>					
		I (000's) (per cent)		II (000's) (per cent)		III (000's) (per cent)	
Goods-producing Sector	45.5	1,803	33.9	1,411	30.7	1,760	34.1
Agriculture	1.4	72	1.4	78	1.7	72	1.4
Other Primary	1.7	—	—	47	1.0	45	—
Manufacturing	37.7	1,397	26.2	1,010	22.0	1,359	26.2
Construction	4.7	334	6.3	276	6.0	284	5.5
Service-producing Sector	54.5	3,066	57.5	3,183	69.3	3,418	66.6
Transportation, Communication and Other Utilities	12.9	318	5.9	281	6.1	334	6.1
Trade	13.1	808	15.2	721	15.7	919	17.0
Finance, Insurance and Real Estate	8.2	207	3.8	212	4.6	230	4.4
Community, Business and Personal Service	16.4	1,733	32.6	1,647	35.9	1,647	31.3
Public Administration and Defence	3.9	—	—	322	7.0	288	5.4
TOTAL	100.0	4,869	91.4 <sup>(1)</sup>	4,594	100.0	5,178	100.0

<sup>1</sup> U.S. productivity measures did not cover all sectors of the economy. The total of 91.4 per cent is based on the 1972 proportion of total employment contributed by industries for which U.S. productivity measures were available.

<sup>2</sup> I U.S. productivity trends, 1948-69.

II ECC projections, 1970-80.

III TE & IA projections, 1970-90.

at time. The employment forecast based on TE & IA productivity projections indicates a total demand for workers that exceeds the total labour force as estimated by Dallimore and Lampert,<sup>4</sup> who suggest that about 4,935,000 persons will be available for employment in 1986, assuming a net migration gain of 60,000 per year. The forecast of total employment in Ontario based on the U.S. experience during 1948 to 1969 also indicates a potentially tight labour market in the mid-1980's. The employment forecast based on productivity trends projected by the Economic Council of Canada for the period 1970-80 indicates a substantially lower demand for labour; hence, there could be some scope for a reduction in the work week in 1985 and possibly some increase in vacation time.

The proportion of total output generated by each sector is the alternative way of looking at the structure of the economy. The contribution of each industry — its value added — is

equivalent to total wages, interest and rent paid, plus the profit or loss earned.

The industrial structure, by this measure, thus depends largely upon who directly benefits from the productivity gains realized. If all productivity gains are retained as higher wages, a structure close to the output projection for 1985 will be obtained. If, on the other hand, the productivity gains are passed on as less expensive products, one of the industrial structures based on employment may be more applicable. The most likely outcome is a structure between these two. In this event, wages would not be so high as they would be if productivity gains accrued to labour alone, nor prices so low as they would be if there were no direct benefits to labour.

#### IV — CONCLUSION

On balance, there appears to be every likelihood that the proportion of gross provincial

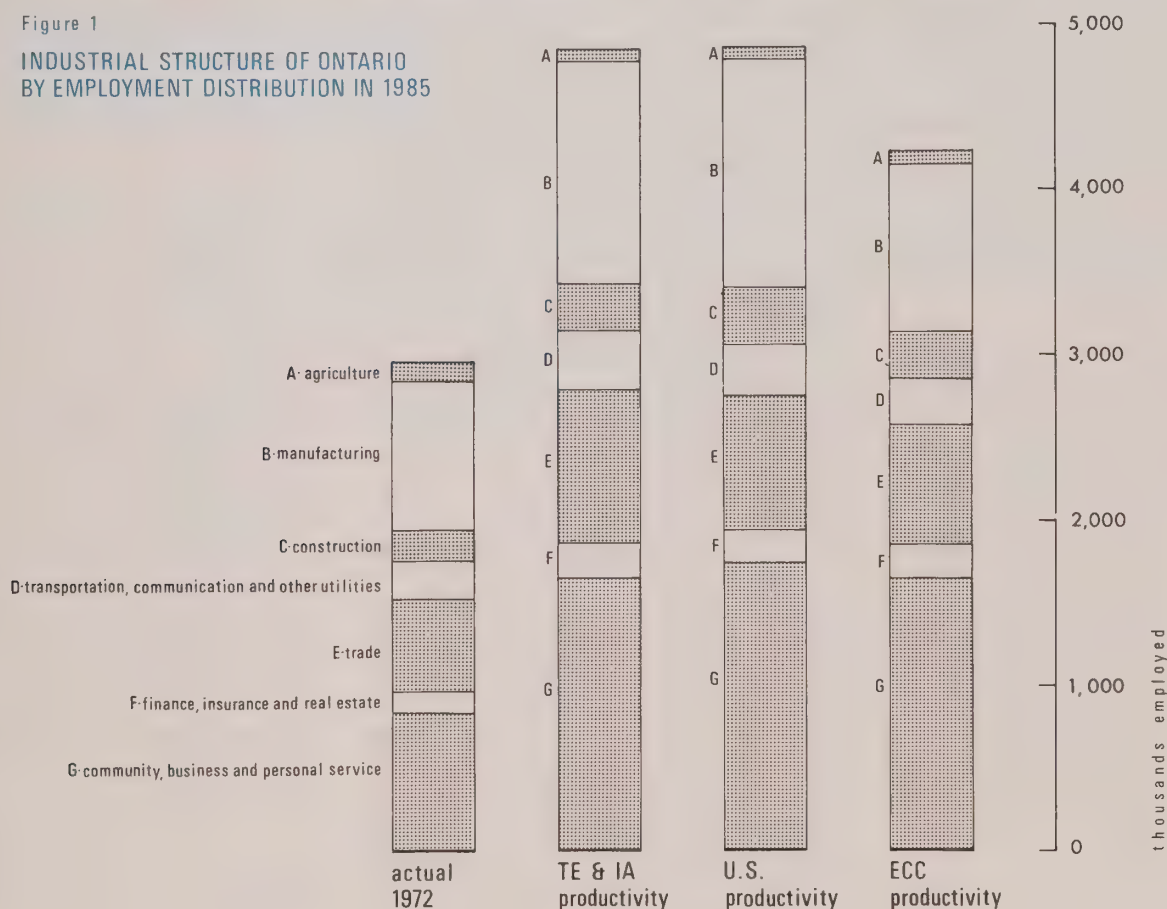
product and of total employment contributed by the manufacturing and the primary industries will decline, mainly as a consequence of the continuing productivity gains achieved by these industries. Concurrently, there will be an increase in the relative contribution made by the service-producing sector (see Figure 1).

The changes in the relative importance of the various sectors will have an important effect on the labour market. The type of jobs that can be offered to the work force and type of skills that will be needed will change significantly.

The growth of the service industries is a characteristic of the post-industrial society. There is no suggestion that the output of goods will decline. The process of adjustment will not be dissimilar to that which has occurred with agriculture where output is as high or higher than ever before. In these circumstances Ontario should be alert to opportunities to develop domestic and international markets for its services.

Figure 1

#### INDUSTRIAL STRUCTURE OF ONTARIO BY EMPLOYMENT DISTRIBUTION IN 1985



It is interesting to note that the total output forecast by this method (weighted on a 1961 base) is very close to that obtained for 1985 by another method. See Dr. Clifford Jutlah's "A Long-Term Economic Forecast for Canada and Ontario", Ontario Economic Review, Vol. 11, No. 4. (Toronto: Queen's Printer, 1973).

<sup>2</sup> Productivity trends in the United States for 1948-1969 were presented by John W. Kendrick, Vice-President, Director of Economic Research, The Conference Board, in an address in New York, May 22, 1973.

<sup>3</sup> Economic Council of Canada, "The Years to 1980", Ninth Annual Review (Ottawa: Information Canada, 1972).

<sup>4</sup> D. C. Dallimore and B. Lampert "Demographic Trends in Ontario: Some Policy Considerations", Ontario Economic Review, Vol. 11, No. 5. (Toronto: Queen's Printer, 1973).



# The Economic Impact of the Mackenzie Valley Gas Pipeline Project

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Policy Planning Branch

## I – INTRODUCTION

The ability of the Ontario economy to meet the economic and social priorities of the Province over the next ten years will depend to a considerable extent on the efficiency of the Canadian financial system in allocating funds to alternative demands for capital assets. It will also depend on the flexibility of capital markets in adapting to sudden sectoral changes in the demand for, and supply of, capital funds.

If unusually large capital demands arise in the industrial and public sectors, other sectors, such as small businesses and housing, experience greater difficulty in competing for necessary funds, and there may even be times when such sectors may not obtain the amount of funds considered socially desirable. It is important, therefore, to identify specific large investment projects that are likely to arise in the medium term, assess their economic impact, and determine their consequences for Ontario's social and economic objectives.

The proposed construction of the Mackenzie Valley Gas Pipeline (referred to as the MVGP throughout the remainder of this article) is one of a number of potential projects that will significantly increase the demand for funds in the medium term. It has been singled out for special study because it is an unusually large project, costing approximately \$5 billion. There are three basic issues of interest concerning the impact of a project of this size:

1. There is a strong possibility of an appreciation of the exchange value of the Canadian dollar during the construction phase of the pipeline because of the expected large capital inflows that will be required for financing. Furthermore, upward pressure on the Canadian dollar could well be maintained after the construction is completed because much of the gas from the Mackenzie Delta would be exported initially to the U.S. market and would result in a substantial jump in the value of Canadian resource exports. There is, therefore, some concern that the project, through the appreciation of the Canadian dollar, would adversely affect the competitive position of Canadian export-and import-competing industries.
2. There is an additional concern that if construction takes place during a period of high economic activity, stress would be placed on Canadian industrial capacity, leading to upward pressure on prices, wages, and interest rates.
3. Because such a project would likely be successful in competing for financial capital and

economic resources, it could displace resources intended for existing public-and private-sector economic activities. Growth opportunities in other sectors of the economy might, therefore, be restricted in the short run. Adjustments would have to take place in other industries, and a scarcity of funds might arise for social development capital.

## II – THE ECONOMIC IMPACT OF THE CONSTRUCTION AND OPERATIONAL PHASES OF THE MVGP

The economic impact of the construction of the pipeline is determined by comparing two economic forecasts which were carried out with the aid of a modified version of the TRACE econometric model.<sup>1</sup> The first forecast is the "Basic Economic Forecast" to 1985,<sup>2</sup> which provides for total capital expenditures in energy developments of approximately \$45 billion between 1973 and 1980. Such expenditures include: the continuation of the present rate of oil and gas exploration, development, processing, and distribution; the forecast development of investment expenditures for Ontario Hydro and other electric utilities; and a moderate rate of development of the Athabasca tar sands. The second forecast is based upon the above energy developments, plus the estimated investment expenditures required for the construction of the MVGP and the additional revenues expected from the export of the Mackenzie Valley gas. With the aid of the TRACE model, therefore, two pictures were obtained of the economy – one that excludes the pipeline, and one that includes it.

Certain assumptions had to be made with respect to the construction and operation of the pipeline.<sup>3</sup> In the first set of assumptions it was assumed that construction would take place over a period of five years, beginning in 1976, with the major portion to be completed in the first three years. At full capacity the pipeline would deliver 4.0 billion cu. ft. of natural gas per day. It was further assumed that initially, approximately 60 to 65 per cent of the utilized pipeline capacity would be for Canadian gas with the remainder being U.S. gas from Prudhoe Bay in Alaska. The total cost of the project amounts to approximately \$5 billion, measured at current prices. The financing was assumed to involve a 51/49 split between Canadian and U.S. equity ownership, and a 4/1 debt-equity ratio. Comparisons in this section are also based on the assumption that 67 per cent of the debt was financed from abroad. The import content was assumed to be 20 per cent

of the total cost, with the goods and services imported for the construction of the pipeline being financed from the funds borrowed abroad. It was further assumed that the gross value of gas exports will be about \$1 billion per year. This assumption was based on the view that initially all Canadian gas would be exported during the time period under consideration at a delivered price of \$1.00 per mcf.<sup>4</sup>

The impacts of alternative sets of assumptions concerning foreign-domestic mix of debt financing, different import content, and a later date of construction are considered in later sections.

### The Impact on Business

#### Gross Fixed Capital Formation

The construction of the MVGP would result in large direct increases in investment in non-residential construction and in machinery and equipment, but in addition the increased business activity and income generated by the pipeline construction would induce additional investment in other sectors of the economy. During the years of construction, real non-residential construction spending increases could average about 6.5 per cent, as compared with about a 4.0 per cent annual average increase indicated in the *basic forecast*. With construction completed, a reduction in spending for non-residential construction occurs. This can be compared with a relatively flat performance in the *basic forecast* during this period (see Figure 1).

While a pronounced investment cycle occurs in non-residential construction in the *basic forecast*, the effect of the MVGP project is to increase the amplitude of this cycle. The peaks become higher and the troughs become deeper (see Figure 1). Non-residential construction spending (including the MVGP), therefore, becomes a more unstable factor in the economy than it otherwise would be, inducing greater instability in the economy.

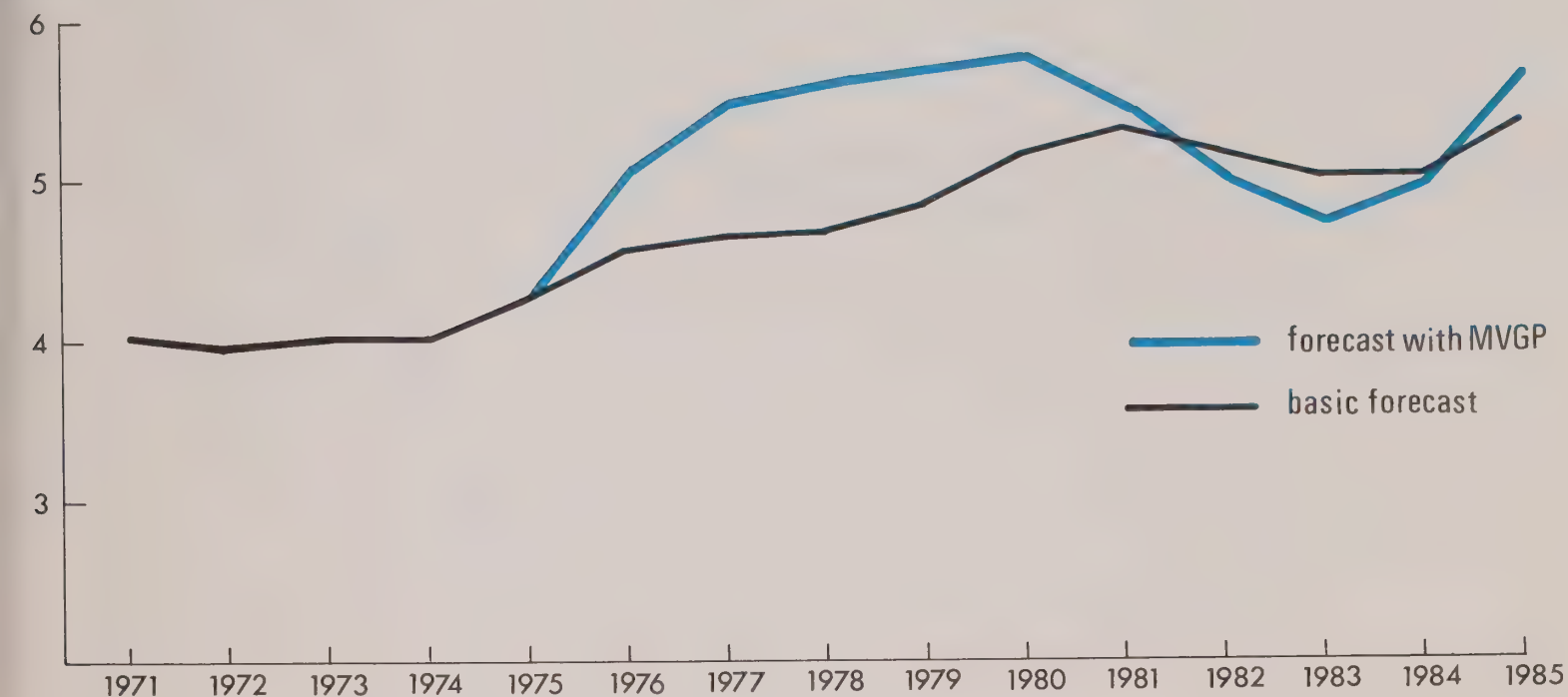
A similar pattern is indicated for investment in machinery and equipment. In this case, the cyclical pattern is less extreme, but the construction of the pipeline results in a more pronounced cycle, making machinery and equipment investment an additional economic destabilizing factor in the pipeline construction period (see Figure 2).

### The Impact on Long-Term Interest Rates

The *basic forecast* indicates that long-term interest rates could continue to increase through the early part of the 1970's, reaching a peak in 1975. They would then gradually

# Fig. 1 - Non-Residential Construction Spending in Constant (1961) Dollars

billions



decline throughout the remainder of the forecast period. With the assumed method of financing, the construction of the pipeline could postpone this forecast reduction. However, the simulations indicate no more than a 5 basis points rise in rates. The overall result is that slightly higher interest rates can be expected during the construction phase of the pipeline, with a subsequent return to a more normal<sup>5</sup> situation (see Figure 3). It is important to note, however, that the impact on interest rates depends to a great extent on the method of financing, which is considered in a later section.

## The Impact on Prices

The increase in business activity initiated by the construction of the pipeline will result in some upward pressure on prices. Unfortunately, because of the assumed timing of the project, the cyclical nature of price level changes indicated by the *basic forecast* is reinforced by the project. The *basic forecast* indicates a rise in the rate of price level increase until 1977. The construction of the pipeline strengthens this rise in prices in the latter part of the 1970's (see Figure

4). In the *basic forecast* price increases average 4.8 per cent per year in 1978-79. This would jump to 5.6 per cent if the pipeline were constructed.

## The Impact on the Balance of International Payments and the Exchange Rate

During the construction phase of the pipeline there would be an increase in long-term capital inflows of approximately \$4.0 billion. In the early stages, the largest part of the increase would arise from the foreign borrowing required for the financing of the project. In the later stages of construction, the increased inflow is a result of the rise in Canadian long-term interest rates and an acceleration in investment spending generated indirectly by the construction of the pipeline. The increased investment spending will place even greater demands on a Canadian capital market that will be severely strained to meet the borrowing requirements of governments, housing, and business.<sup>6</sup> The additional domestic financing demands due to the MVGP could mean that corporations and perhaps some governments might have to

borrow in foreign markets to a greater extent than they would otherwise have had to.

The increase in long-term capital inflows would exert strong upward pressure on the value of the Canadian dollar. However, at the same time, there would be some downward pressure because of an increase in the deficit on current account.

The increased business activity generated by the pipeline construction, along with the rise in domestic prices during the later stages of construction, results in a larger increase in imports of goods and services than that predicted in the *basic forecast*. The net result is a reduction in the merchandise trade balance and a slight increase in the service transactions deficit, resulting in an overall increase in the current account deficit which very nearly compensates for the increase in long-term capital movements. The outcome is that the appreciation of the Canadian dollar is held to approximately 1.0 per cent during the construction period. Canadian exports of goods and services, therefore, should not be affected to any appreciable degree by the indirect economic effects of the construction of a gas pipeline from the



Fig. 2

## Investment in Machinery and Equipment in Constant (1961) Dollars

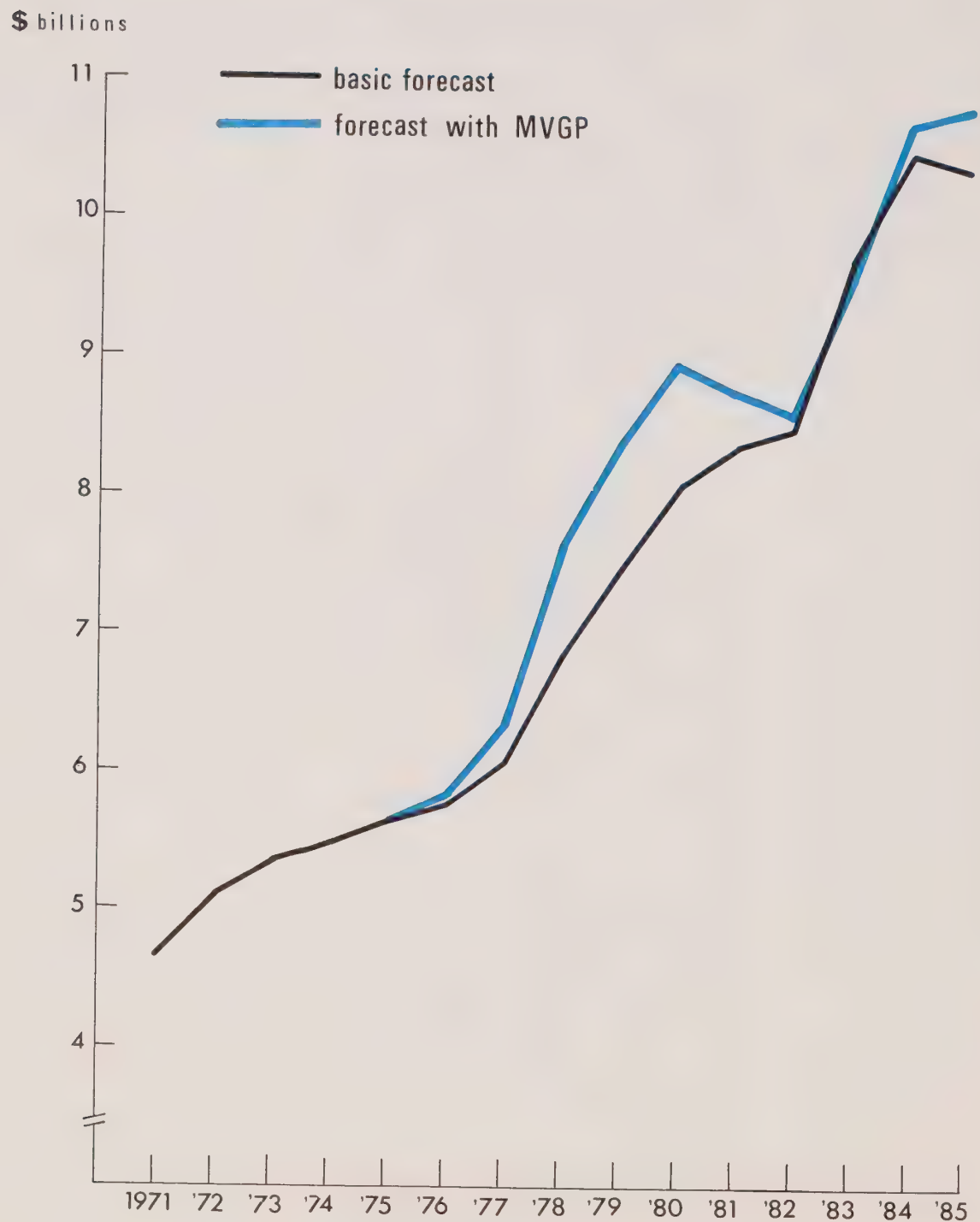


Fig. 3 - Interest Rate on Government of Canada Bonds ( over 10 years )

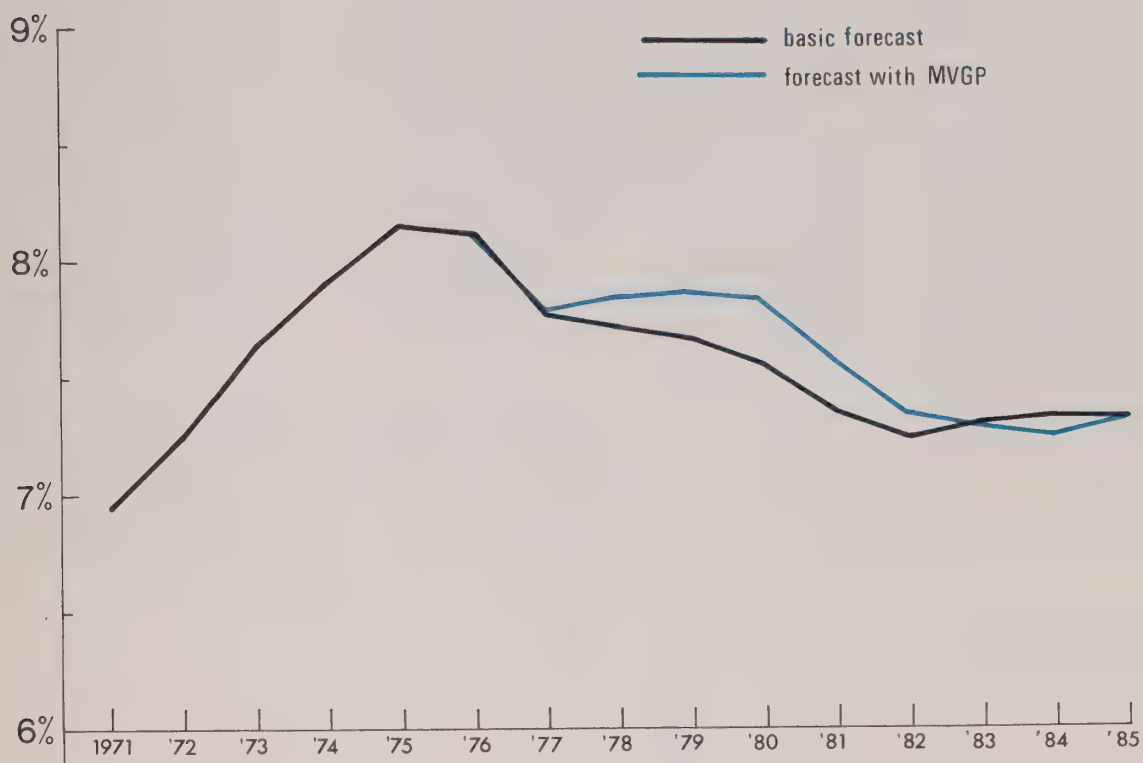
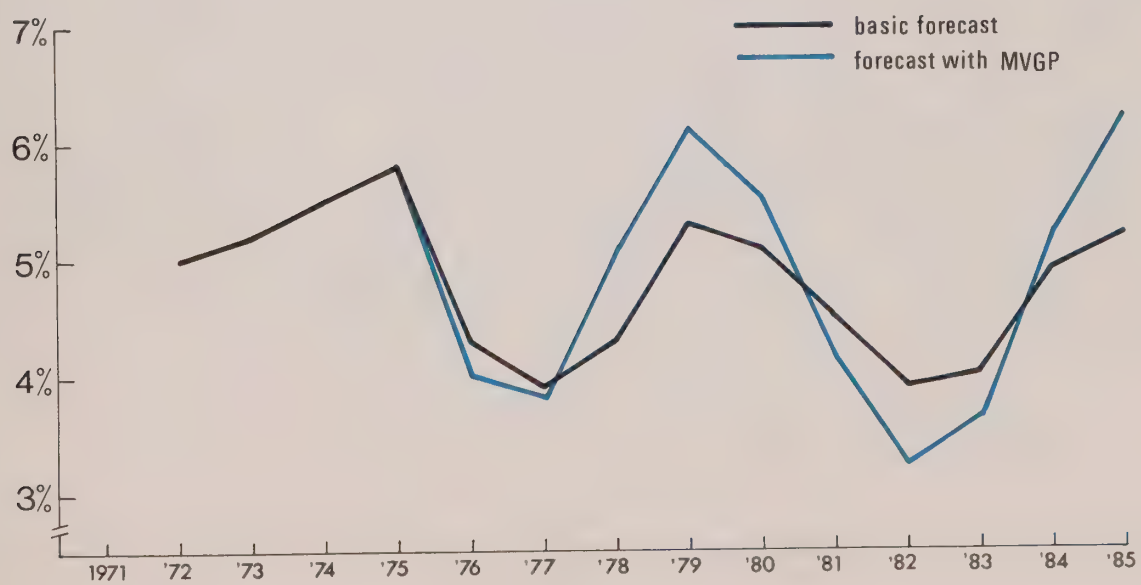


Fig. 4 - Change in GNP Implicit Price Deflator





Mackenzie Delta. However, this would hold true only under the assumptions of financing and import content given above.

With construction completed, there would be a jump in exports, due to the additional sales of gas to the United States. This gain in exports would exert some upward pressure on the Canadian dollar, but, at the same time, long-term capital movements should begin to taper off because the large financing aspects would have come to an end and because interest rates would have fallen back to "normal" levels. There might also be an increase in the service transactions deficit arising from the increase in income paid to non-residents holding pipeline bonds and shares. The overall result would be that in the post-construction phase there would be little upward pressure on the Canadian dollar as a result of the MVGP operations.

#### The Impact on Employment and the Unemployment Rate

The number of jobs directly created during construction of the MVGP has been estimated at

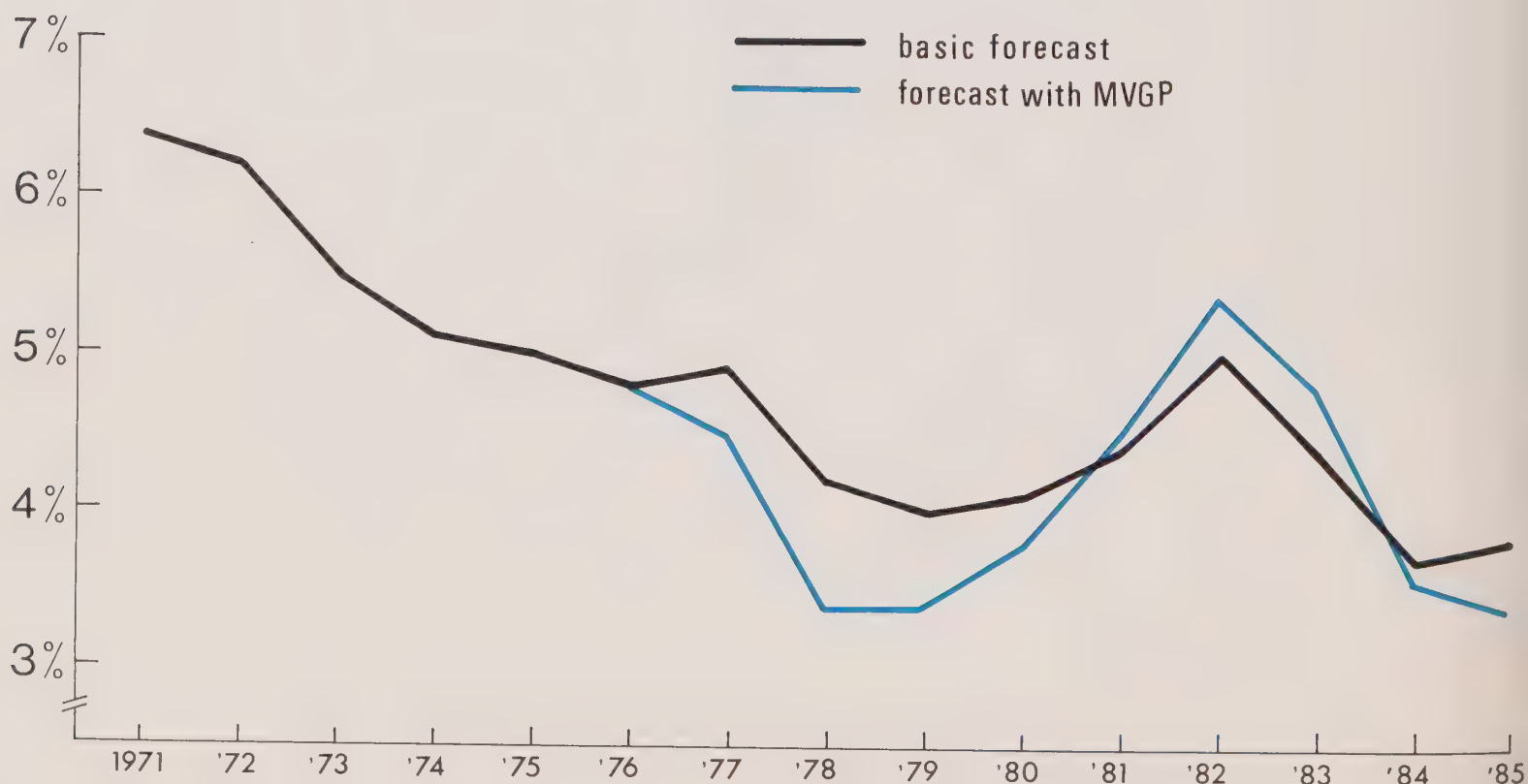
7,000<sup>7</sup>, and there will also be large indirect and induced employment effects. From 1976 to 1980 the *basic forecast* indicates an average unemployment rate of 4.4 per cent, with a low of 4.0 per cent in 1979. With the construction of the MVGP, the average unemployment rate during this period falls to 4.0 per cent, with a low of 3.4 per cent occurring in both 1978 and 1979 (see Figure 5). Labour markets could be tight from 1978 to 1980 — presenting a different set of labour supply problems from those experienced in the past few years. However, with construction over, employment would be adversely affected, and the unemployment rate could jump to an average of about 5.0 per cent in the early 1980's. This rate can be compared with an average rate of 4.6 per cent in the early 1970's if the pipeline is not constructed. The projected path of the unemployment rate again emphasizes the degree of economic and social instability that can result from capital projects the size of the MVGP unless suitable governmental policy offsets can be applied.

#### The Impact on GNP

The overall effect of construction and operation of a gas pipeline from the Mackenzie Delta would be to increase investment in non-residential construction and machinery and equipment during the construction phase of the project by \$6 to \$7 billion in real terms. At the same time, there could be some increase in imports. The overall result would be to raise the growth rate of real GNP in the period of construction slightly above the forecast rate for an economy without the MVGP. When construction is completed, there would be a reduction in investment activity, but the additional growth in the gas exports offsets to some extent the reduction in investment spending. The aggregate effect could be a very slight reduction in the economy's real growth rate compared with an economy without the pipeline during the first few years after construction.

Although the annual average forecast growth of GNP differs very little during the forecast period, with or without the construction of the

Fig. 5 - Unemployment Rate



eline, there is a difference in the pattern and timing of that growth. With the inclusion of the MVGP, the peaks of business activity are higher and the troughs lower (see Figure 6).

#### THE CONSEQUENCES OF INCREASING THE IMPORT CONTENT

It has been suggested that the adverse economic impacts of the pipeline could be lessened by increasing the import content of the pipeline construction. The essence of the argument is that if all imports were purchased by funds borrowed abroad, there would be a reduction in

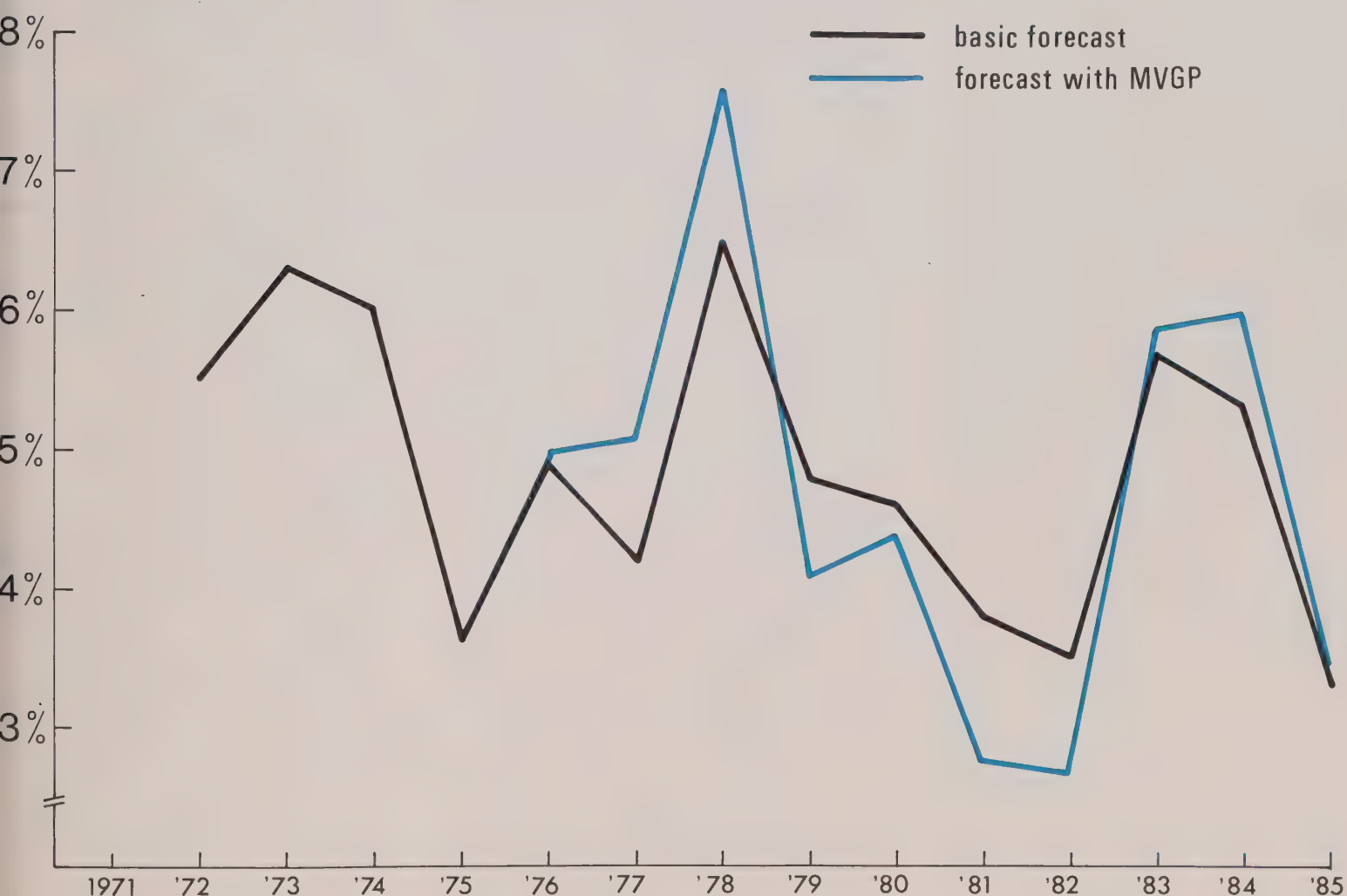
the long-term capital inflow, compared with a case of lower import content. From this would flow reduced upward pressure on the value of the Canadian dollar and less disruption to the Canadian economy.

To determine the validity of this argument, a simulation was carried out in which the import content was doubled over that of the previous simulation to 40 per cent of the capital cost of the project. All other assumptions remained unaltered. It should be noted, however, that even with this relatively high import content there would be some direct increase in net long-term capital inflows, compared to an economy without the pipeline. This would always be the case unless the import content became as great as

the amount borrowed abroad, which is rather unusual in construction projects of this kind.

With the higher import content, total investment spending follows the same path as indicated in the case with 20 per cent import content (but at a slightly lower level during the construction phase). This would be the case because the replacement by imports of domestic inputs used in the pipeline construction would result in a reduction in indirect investment. Investment still contributes to instability, but not to the same degree as would be the case with a lower import content. To this extent, the substitution of imported materials would lessen the destabilizing impact of the pipeline on the national economy.

Fig. 6 - Growth Rates in Real GNP





Long-term capital movements would also follow the same path as in the 20 per cent import content case (but again at a slightly lower level). Therefore, the upward pressure on the Canadian dollar would not be so great as it would be in the 20 per cent export content case. Even with a doubling of the import content from 20 per cent to 40 per cent of the capital cost, there would be an increase in business activity, compared with an economy without the pipeline. This would result in increased imports of goods and services, with an increase in the current account deficit. Of course, the increase would not be so great as that in the 20 per cent import content case, yet it would be of sufficient size to completely compensate for the increase in long-term capital inflows. There would be, therefore, little or no tendency for the Canadian dollar to appreciate; and as a result, exports would be slightly higher in this case than they would be in a situation where the import content of the pipeline were only 20 per cent. The higher relative level of exports would furthermore make up for the reduction in investment spending, so that business activity of the 40 per cent import content case would be similar to, but more balanced than, the level and path of business activity of the 20 per cent content case.

The impact on prices, interest rates, employment, and the unemployment rate are also similar. Price increases during construction could average 4.9 per cent in both the 20 per cent and 40 per cent import content case, up from the projected average of 4.6 per cent annual rate of increase during this same period (1976-1980) in an economy without the pipeline. Unemployment could average 4.0 per cent in the period during construction, jumping to a 4.8 per cent to 4.9 per cent annual average in the three years immediately after construction ends. (In both import cases, the unemployment rate, at its lowest level, could fall to 3.4 per cent.) Interest rates could average 10 to 15 basis points higher in both cases, compared with rates projected in the *basic forecast*.

The results of this particular simulation, therefore, indicate that the aggregate economic impact of the construction and operation of the pipeline will not be reduced by any appreciable amount by increasing the import content of the pipeline construction. Aside from the issue of balance between imports and exports and the stability of the investment goods industries, there would be just as much pressure on the country's productive capacity, price level, labour markets, and interest rates if the import content of the project were 40 per cent, as there would if the import content were 20 per cent.

#### **IV – THE CONSEQUENCES OF INCREASING THE PROPORTION OF FOREIGN DEBT**

Under the first set of assumptions, 67 per cent of the long-term debt requirements would be obtained abroad. To determine the impact of increasing the proportion of foreign long-term debt, another simulation was run in which 100 per cent of the long-term debt was foreign financed. (All other assumptions remain as outlined in Section II.)

Increasing the proportion of foreign debt would have no impact on investment spending during the early construction phase of the pipeline. With 100 per cent foreign-debt financing, long-term capital inflows are, of course, larger and therefore there would be greater upward pressure on the exchange value of the Canadian dollar. As indicated in Section II, under the first set of assumptions, which includes 67 per cent foreign-debt financing, the Canadian dollar could appreciate by 1 per cent during the early construction stage, compared with an economy without the pipeline. By increasing the proportion of foreign-debt financing to 100 per cent, there could be at least a 2 per cent appreciation. The growth of exports would be reduced to some extent, with some increase in the level of imports. However, the resulting increase in the current account deficit would prevent the dollar from appreciating as much as might be expected.

Under conditions of high foreign-debt financing, because of reduced export activity, increased imports, and essentially unchanged investment spending, there would be a slight slowdown in business activity in the early stages of construction, compared with a situation where the proportion of foreign debt were less. This shows up in the projections of a slightly higher unemployment rate,<sup>8</sup> marginally lower interest rates, and a lower rate of inflation.

As the main financing aspects of the pipeline construction come to an end, investment activity in general would increase with the lower interest rates and greater availability of domestic funds for investment. In the post-construction phase, the economy would closely resemble the situation in which the financing of the pipeline were carried out with a smaller proportion of foreign long-term debt.

#### **V – THE CONSEQUENCES OF INCREASING THE MONEY SUPPLY DURING CONSTRUCTION**

Given the assumptions that 51 per cent of the equity will be issued in Canada, that 33 per

cent of the long-term debt is to be domestic debt, and that substantial bank loans will be required, capital markets would be tight during the time required to finance the project.<sup>9</sup> In order to make it somewhat easier to carry out the domestic financing, there might be a tendency on the part of the federal government to increase the money supply at a greater rate than that assumed for the above simulations and that for the *basic forecast*. There also exists the possibility that the federal government would purchase some or all of that part of the long-term debt which is issued in Canada. In order to lessen the impact on domestic capital markets, it would seem likely that federal government purchases of this debt would be financed by increases in the money supply.

In order to determine the economic impact of such an increase in the money supply, a simulation was run in which the rate of increase in the money supply was accelerated to take into account the increased domestic debt load required by the MVGP. It was assumed that after the financing phase was completed, the rate of increase in the money supply would be reduced to a constant rate of 10 per cent per year.<sup>10</sup>

If the money supply were increased in the manner indicated above, a larger proportion of domestic financing demands would be met in this case than that in a situation where the money supply were not increased, and business activity would increase accordingly. Because of this greater demand, a severe strain would be placed on domestic plant capacity, and an acceleration in the rate of inflation would occur. In the last three years of construction (1978-80), increases in the GNP Implicit Price Deflator would average 6.4 per cent per year under the assumption that the money supply be increased by an amount equivalent to the increase in the domestic debt load of the MVGP. This compares with a 5.6 per cent rate of increase if the increase in the money supply were not to take account of this additional domestic debt financing, and a 4.9 per cent average rate of increase in an economy without the pipeline.

To discount this higher inflationary factor, interest rates could be approximately 65 basis points higher towards the end of the construction period, compared with those rates in the *basic forecast*.<sup>11</sup> It would not be until the mid 1980's that they would move down to approximately the levels that would prevail if money supply were kept at a constant rate of increase.

Investment spending would move up slightly with the greater availability of domestic funds. Imports would increase somewhat with the



ase in investment activity and higher  
stic prices. The price rise would also result  
slowdown in exports. Because of the  
ases in imports and reductions in exports,  
upward pressure on the exchange rate  
d be fully compensated for, so that during  
period of construction and financing the  
ange rate would not be affected.

f all the simulations considered in this  
y, the one described above resulted in the  
est instability in the economy. However, it  
d be pointed out that the resulting impact  
nds to a considerable extent on the phase  
e business cycle when the construction and  
ncrease in the money supply take place.  
*basic forecast* indicates that from 1976-80  
economy moves from a period of a rela-  
y low business utilization rate to one  
relatively high utilization rate. Imposing a  
r rate of increase in the money supply in  
period results in higher rates of inflation  
higher interest rates as indicated above.  
ever, larger increases in the money supply  
g a period of slackness in the economy  
d quite likely give different results from  
recorded here, and might be an appro-  
e policy.

## THE CONSEQUENCES OF POSTPONEMENT

use of the economic instability generated  
project as large as the MVGP (if initiated  
e mid-1970's), and because of the unlikeli-  
that frontier gas will be required for  
estic use until at least the mid-1980's, it is  
ome interest to determine the economic  
ct of the pipeline if the construction were  
oned for a few years. Furthermore, the  
*forecast* indicates that from 1978-79 to  
the economy could move from a period  
relatively high capacity utilization to a  
d of a relatively low capacity utilization.  
mulating a postponement of construction  
1979, we can also determine if the economic  
ct of the pipeline differs from the case  
e construction occurs during a different  
e of the business cycle. Accordingly, a  
ation was run to obtain a picture of the  
omy if construction of the pipeline did not  
until 1979. It was assumed that, because  
flation, the cost of the project would rise  
5.8 billion if started in 1979. All other  
ptions were unchanged from those in  
on II.

s in the previous simulations, large  
ases would occur in investment spending in  
residential construction and in machinery  
equipment. The rate of inflation also rises

slightly because of the increase in business  
activity, and this increase in inflation is incor-  
porated in interest rates so that long-term  
interest rates also rise slightly. In both cases,  
however, the rise would not be so great as that  
in the previous simulations, reflecting the dif-  
ferent phase of the business cycle in which con-  
struction would begin. For the five years of  
construction, 1979-83, the GNP Implicit Price  
Deflator would average 4.8 per cent per year,  
while in the *basic forecast* the Deflator averages  
4.6 per cent increase per year. The long-term  
interest rate would rise by only 10 to 15 basis  
points — one half the rise that would occur in  
interest rates with construction beginning in  
1976.

Long-term capital inflows would follow  
closely the path of long-term capital inflows in  
an economy with no MVGP, but at a higher  
level. There would, therefore, be some upward  
pressure on the value of the Canadian dollar,  
and a slight appreciation of about 1 per cent  
early in the construction phase. Again, the  
appreciation would not be so great as might be  
expected because the upward pressure would be  
counteracted by a larger current account deficit  
accompanying the increase in economic activity  
initiated by the pipeline construction.

The unemployment rate, as expected, would  
fall, averaging 4.0 per cent during the first half  
of the 1980's, compared with 4.3 per cent in an  
economy without the pipeline, and with the 4.3  
per cent that would exist in an economy in  
which the pipeline construction began in 1976.

## VII — THE IMPACT ON CANADA'S CAPITAL MARKET

There has been some concern expressed that  
the financing of a \$5 billion project would  
place undue strain on Canada's capital markets,  
which might retard development of other  
sectors in the economy. It is of some interest  
then to note what changes in the financial  
picture could take place as a result of the con-  
struction of the MVGP. This is examined here  
in terms of Canada's overall capital require-  
ments, the availability of domestic savings, the  
financial position of governments, the financing  
of business investment in plant and equipment,  
and residential mortgage financing.

It has already been pointed out that  
although such a large project would involve an  
increase in direct employment of only 6,000 to  
7,000 man-years during the construction phase,  
indirect and induced increases in employment  
would be quite substantial in the short term. In  
the same way, the increase in gross investment  
would not be just \$5 billion, because large  
increases in investment spending would be gen-

erated in sectors supplying materials and  
services to the pipeline; other increases in  
investment would also occur because of the  
general rise in business activity. The results of  
the various simulations that were run indicate  
that during the assumed construction period,  
1976-80, gross investment by all levels of gov-  
ernment and the private sector on housing,  
plant, equipment, and inventories would  
increase by \$17 billion — from \$195 billion in  
the *basic forecast* (an economy without the  
MVGP) to \$212 billion in an economy that  
included the MVGP.

The increases in domestic savings generated  
by the rise in economic activity would be: \$2  
billion from the personal sector and \$11 billion  
from capital consumption allowances, undistri-  
buted corporate profits, and government  
savings. The increase in domestic savings would,  
therefore, fall short of the \$17 billion increase  
in investment requirements by \$4 billion. This  
shortfall would be made up by an increase in  
the use of foreign savings in the form of net  
inflows of long-term debt and equity.

The financial position of governments would  
improve in an economy with the MVGP if there  
were no change in the rate of growth of govern-  
ment spending during the construction period  
over that assumed for this study.<sup>12</sup> Because of  
the increase in incomes and spending, espe-  
cially investment spending, the combined  
governments in Canada in the 1976-80 period  
would register an increase in their total surplus  
from \$0.5 billion as indicated in the *basic fore-  
cast* to \$7 billion if the MVGP were built. Most  
of the increase in government revenues would  
come from increases in indirect tax revenues  
(approximately \$4 billion) and higher revenues  
from personal and corporate income taxes. Thus,  
the cash needs of the combined governments  
would not be so great as that indicated in the  
*basic forecast*, and therefore they would not  
have to finance in capital markets as heavily as  
indicated for an economy without the MVGP.<sup>13</sup>

The private business sector presents a differ-  
ent picture. Without the MVGP, the private  
business sector could require about \$162 billion  
in the 1976-80 period to finance inventories  
and capital expansion. However, in an economy  
with the pipeline, the private business sector  
will require \$179 billion — an increase of \$17  
billion. In the 1971-75 period, it is estimated  
that private sector capital consumption allow-  
ances and undistributed profits would account  
for 63 per cent of business capital require-  
ments. In an economy without the MVGP, the  
proportion would jump to 72 per cent.<sup>14</sup> How-  
ever, although in the future private business  
would be relatively less dependent on capital



markets to finance its investment requirements than in the past, in an economy that included MVGP the proportion of internal financing would increase to only 66 per cent. Much of the \$17 billion in additional capital required, therefore, would have to be financed through Canada's capital markets and/or foreign borrowing.

Additional mortgage financing would also increase the strain on domestic capital markets. The estimated shortfall of mortgage funds, which averages \$1 billion per year in the 1973-85 period in an economy without the MVGP, would increase if the pipeline were constructed.

It would appear, then, that if construction of the pipeline goes ahead, domestic capital markets would be under considerable strain during the construction phase. In comparison with an economy that did not include the pipeline, a situation could arise in which the financing needs of governments would not be so great, while the requirements of the business sector would be much greater, and the requirements for mortgage financing slightly larger. The financial picture that develops is one in which there would be much stronger competition for the available long-term funds during the period in which the pipeline were constructed. Under such conditions, some demanders of funds — small business, new ventures, and housing — might not be as adequately financed as society would want.

## VIII — SUMMARY AND CONCLUSIONS

A large investment project such as the MVGP would induce substantial increases in investment spending, employment, and economic activity in general. Unfortunately, these would be only short-run impacts and would be reversed when the construction period ended. Such a large project, then, would create a certain amount of economic instability and, therefore, cause some economic and social disruption.

During the construction phase of the pipeline, some strain would be placed on plant capacity within the economy and there would be some upward pressure on prices, as well as interest rates. There would be only a slight appreciation of the exchange rate and therefore such a project would not deal a great blow to Canada's exporting-or import-competing industries. The "costs" of the project in terms of price, interest rate, and exchange rate pressures do not appear to be too excessive and would last only during the construction phase.

There is no doubt, however, that Canadian financial institutions would be hard pressed to meet all domestic financing requirements during the period of construction. The financial needs of both large and small business, governments, and the housing industry would not be as adequately met compared to the situation in which the pipeline were not constructed. Furthermore, the period of construction would be characterized by tight labour markets, followed by relatively large increases in unemployment when construction comes to an end. Both tight labour markets and tight financial markets could lead to the postponement, or even a permanent setback, of development in some sectors of the economy. This would especially be the case if other large energy or natural resource developments were initiated upon completion of the MVGP. The implications of such a situation would result in a considerable reduction in the options available for other economic development strategies as well as options for other economic and social policy objectives.

If domestic gas requirements grow to the extent that the Mackenzie Delta gas is required by the 1980's and the construction of the pipeline proceeds, then government policies and planning will be required to reduce the instability and disruption that could result. There is certainly a need to ensure that the construction of the pipeline would not occur at the same time as other major projects, such as a more intensive development of the Alberta tar sands. If such developments were bunched to any extent, the large capital expenditures and financing requirements would lead to serious economic disruption.

Usually in a situation in which there is a sudden economic expansion followed by a period of relative slack, monetary and fiscal policy are employed to smooth out the growth path of the economy. Unfortunately, these traditional tools of policy do not appear too promising in this case. If a restrictive monetary policy were followed during the construction period to keep the expansion in hand, a tight financial market situation would become even tighter. This would mean larger foreign capital inflows and a greater appreciation of the Canadian dollar. It would also mean reduced development in such sectors as housing, transportation, and manufacturing. On the other hand, a more accommodating monetary policy to ease the strain which financial institutions would be undergoing at this time could result in even greater instability in the form of higher inflation rates and higher interest rates. The monetary authorities would have to tread a fine line

with monetary policy during the construction period, resulting in the loss of considerable policy flexibility.

While fiscal policy appears to be the alternative, it has some disadvantages in that it would result in a deliberate shift of construction and investment out of the private sector to make way for the pipeline. To cool off the economy during the construction period, higher corporate and personal tax rates could be raised and reductions made in the rate of increase of government spending. Governments could increase spending and cut taxes after the construction period to ease the relative slack that would occur in the post-construction period. But, such a policy would result in cutbacks in government services that are socially or economically desirable, and taxes would need to be increased to an extent that would postpone or perhaps even reduce economic development in other sectors of the economy.

Furthermore, the simulations considered in this study indicate that neither changing the import content of the pipeline nor changing the proportion of foreign debt would make the situation easier to bear. The economic impact of the construction and operation of the pipeline would not be reduced to any appreciable extent by increasing the import content of the pipeline, and raising the proportion of foreign debt would result in a greater appreciation of the Canadian dollar, with some reduced growth of exports.

The important issues that have emerged from this study are that the construction of the MVGP would not result in excessive increases in prices, interest rates, or the exchange rate. The problem areas, on the other hand, appear to be:

1. Some tightness within the capital markets resulting in difficulties for some sectors of the economy in obtaining the amount of funds which the community may feel to be socially desirable.
2. The tightness that would develop within labour markets during the construction of the pipeline and that could well remain if other large projects come on-stream immediately after completion of the MVGP. Such tightness would result in labour shortages in some skill areas and serious bottlenecks would no doubt arise.

The summary of the economic impacts of different policy options of financing, import content, and construction periods are presented in the Appendix to the article.

RACE is an econometric model which was developed by the Institute for the Quantitative Analysis of Social and Economic Policy at the University of Toronto.

Dr. Clifford Jutlah, "A Long-Term Economic Forecast for Canada and Ontario", Ontario Economic Review, Vol. 11, No. 4 (Toronto: Queen's Printer, 1973).

Assumptions concerning the construction and operation of the pipeline are based upon a survey of the available literature and public statements regarding the MVGP project.

The delivered price of \$1.00 per mcf was based on the wellhead prices included in the existing contracts between Imperial Oil and two U.S. pipeline companies and a tariff rate which covers depreciation, direct operating expenses, interest on debt, corporation income taxes, and a 14 per cent return on the book value of equity. For further details on the pricing of the delivered gas, see John Helliwell, Department of Economics, University of British

Columbia, "More on the National Economic Effects of Arctic Energy Developments", mimeo.

<sup>5</sup> Normal in the sense of being very similar to the rates indicated in the basic forecast.

<sup>6</sup> See Jutlah.

<sup>7</sup> According to V. L. Horte, President, Canadian Arctic Gas Study Limited, in a speech to the Toronto Society of Financial Analysts, April 18, 1973, "Direct employment during construction will amount to approximately 7,000; once operations commence, this will drop to about 600".

<sup>8</sup> For the first three years of construction, 1976-78, the unemployment rate in the basic forecast averages 4.6 per cent. In an economy with MVGP under construction and with 67 per cent foreign-debt financing, the unemployment rate averages 4.2 per cent; while in an economy with MVGP under construction and 100 per cent foreign-debt financing, the unemployment rate averages 4.4 per cent.

<sup>9</sup> Even without the construction of the MVGP, capital markets will be under some strain in this period. See Jutlah.

<sup>10</sup> It was assumed for the basic forecast and all simulations made in this study, other than the simulation in this section, that the money supply increased by a constant 10 per cent per year.

<sup>11</sup> In the simulations described in Section II, in which it was assumed that the MVGP is constructed, but money supply increases at the same rate as in the basic forecast, interest rates are 26 basis points higher, compared with those rates in the basic forecast.

<sup>12</sup> For more details concerning the estimates of government spending during this period, see Jutlah.

<sup>13</sup> Ibid. In the basic forecast, the cash needs of the governments are estimated to be about \$21 billion in the 1976-80 period.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

## Appendix

## POLICY OPTIONS AND IMPACT

### Kenzie Valley Gas Pipeline, 1976-80 Construction Period

Factor	Basic Forecast	20% Import Content 67% foreign debt	40% Import Content 67% foreign debt	20% Import Content 100% foreign debt	20% Import Content 67% foreign debt with increase in money supply
Average long-term Government of Canada Bond Rate . . . . .	7.76%	7.85%	7.91%	7.82%	8.04%
GDP Deflator (Average rate of increase)	4.6%	4.9%	4.9%	4.9%	5.5%
(Highest rate of increase in any one year) . . . . .	5.3%(1979)	6.1%(1979)	5.8%(1979)	6.4%(1979)	7.2%(1979)
Imports (Total in billions of current dollars) . . . . .	\$211	\$214	\$215	\$213	\$217
Exports (Total in billions of current dollars) . . . . .	\$227	\$233	\$235	\$233	\$239
Long-term Capital Inflows (Total in billions of current dollars) . . . . .	\$15.0	\$18.9	\$18.3	\$19.7	\$20.2
Exchange Rate (Greatest rate of appreciation) . . . . .	—	1.0%(1976)	nil	2%(1976)	nil
Unemployment Rate (Average)	4.4%	4.0%	4.0%	4.0%	3.5%
(Lowest rate in any one year) . . . . .	4.0%(1979)	3.4%(1978-79)	3.4%(1978)	3.3%(1979)	2.7%(1979)

### Kenzie Valley Gas Pipeline, 1979-83 Construction Period

Factor	Basic Forecast	20% Import Content 67% foreign debt 1979 Start
Average long-term Government of Canada Bond Rate . . . . .	7.40%	7.50%
GDP Deflator (Average rate of increase)	4.6%	4.8%
(Highest rate of increase in any one year) . . . . .	5.3%(1979)	5.2%(1981)
Imports (Total in billions of current dollars) . . . . .	\$273	\$276
Exports (Total in billions of current dollars) . . . . .	\$292	\$299
Long-term Capital Inflows (Total in billions of current dollars) . . . . .	\$19.3	\$23.4
Exchange Rate (Greatest rate of appreciation) . . . . .	—	1%(1979)
Unemployment Rate (Average)	4.3%	4.0%
(Lowest rate in any one year) . . . . .	4.0%(1979)	3.7%(1981)



# Selected Economic Indicators

## Leading Indicators

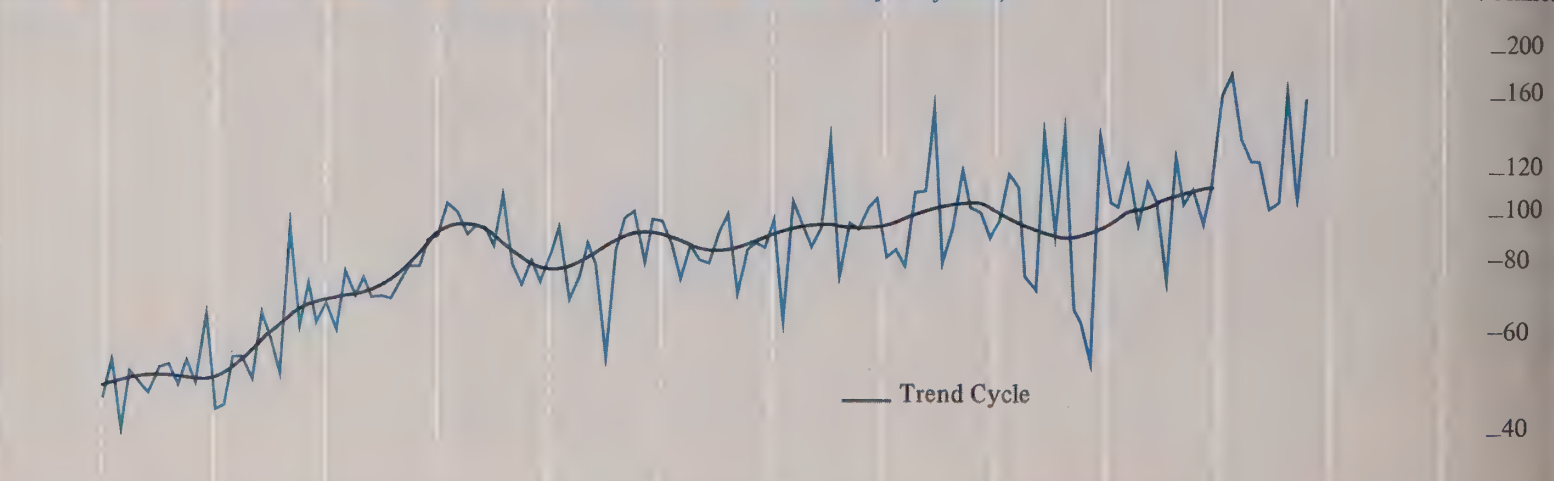
Average Weekly Hours Worked in Manufacturing, Ontario (Seasonally Adjusted)



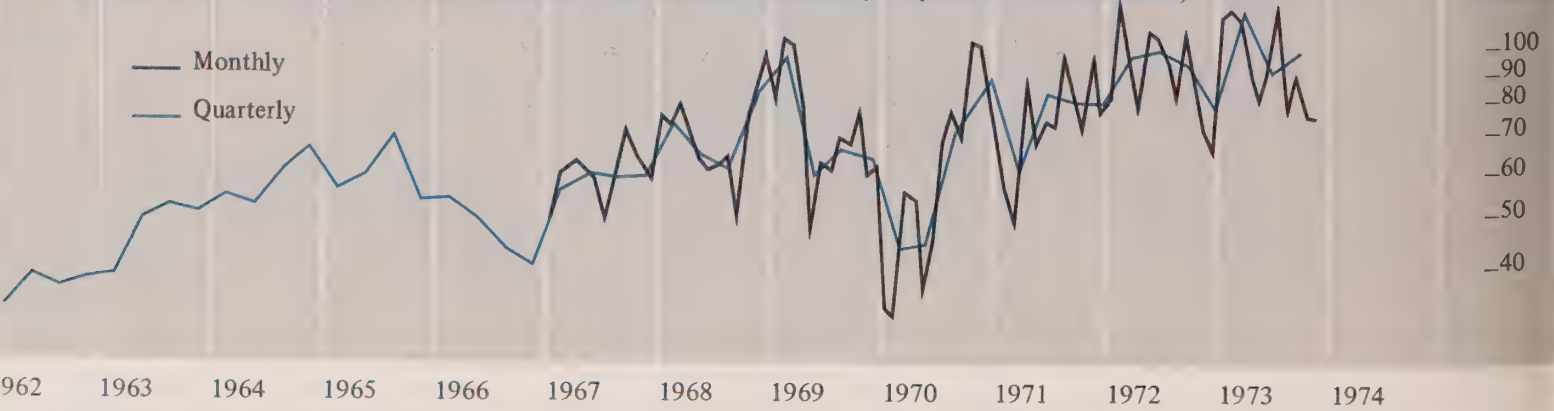
New Orders in Manufacturing Industries, Canada (Seasonally Adjusted)



Building Permits Issued in Ontario, Non Residential Construction (Seasonally Adjusted)



Housing Starts in Centres of 10,000 Population and over, Ontario (Seasonally Adjusted at Annual Rates)



## Leading Indicators

**Total Money Supply, Canada** (Average of Wednesdays, Seasonally Adjusted)

\$ Billion

Scale L1

45  
40  
35  
30  
25

**Toronto Stock Exchange Industrial Index** (1956 = 100, Not Seasonally Adjusted)

Index

Scale L2

240  
220  
200  
180  
160  
140  
120

## Coincidental and Lagging Indicators

**Gross National Product, Canada** (Quarterly, Seasonally Adjusted at Annual Rates)

\$ Billion

Scale L1

110  
100  
90  
80  
70  
60  
50

— Current Dollars  
— Constant (1957) Dollars

new series  
constant (1961) dollars

**Average Hourly Earnings in Manufacturing, Ontario** (Seasonally Adjusted)

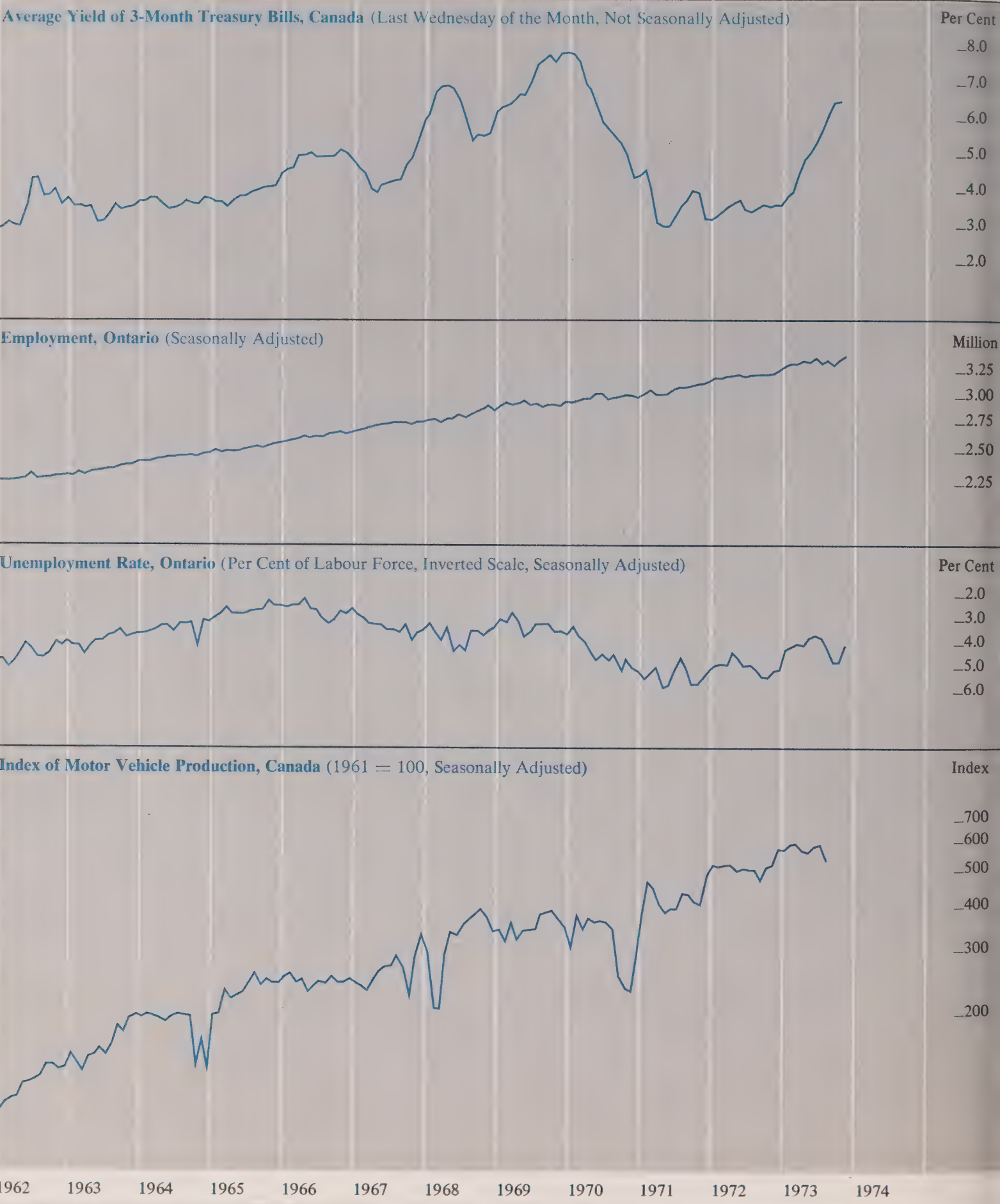
Dollars

Scale L1

4.00  
3.50  
3.00  
2.50

1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974

# Coincidental and Lagging Indicators





	1972					1973									
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	
Leading Indicators															
Average Weekly Hours Worked in Manufacturing	40.4	40.4	40.2	40.9	40.8	40.6	40.6	39.9	39.8	40.1	38.9	39.2	39.9	39.9	
New Orders in Manufacturing Industries <sup>c</sup>	4,813.4	4,844.6	4,924.7	5,019.4	5,308.7	5,379.2	5,450.8	5,381.3	5,526.2	5,441.6	5,688.5	5,470.3	5,747.5	5,938.1	
Building Permits Issued in Ontario, Non-Residential Construction	107.1	113.4	103.4	122.5	163.0	178.9	136.2	124.9	124.0	102.7	105.0	174.8	103.8	160.1	
Urban Housing Starts (Annual Rate)	108,500	91,600	71,800	66,500	116,000	118,200	114,600	91,500	82,300	93,100	123,900	76,900	91,500	77,600	
Money Supply <sup>c</sup>	41,515	42,028	42,287	42,837	43,554	44,165	44,511	45,038	45,840	46,195	46,799	47,359	47,838	48,537	
T.S.E. Industrial Index <sup>u</sup>	210.8	203.2	215.4	221.6	223.0	220.8	223.8	215.3	205.9	208.4	219.3	215.2	225.3	237.3	
Business Failures <sup>u</sup>	67	100	102	82	77	129	—	92	107	85	80	60	99	93	
Business Failures — Liabilities <sup>u</sup>	4.5	4.1	13.8	3.8	3.9	8.9	—	5.9	8.6	4.9	4.9	3.5	8.9	11.7	
Coincidental and Lagging Indicators															
Gross National Product <sup>c</sup> (Annual Rate)	104,068			107,804			113,096			116,296			119,080		
Average Hourly Earnings in Manufacturing	3.82	3.84	3.86	3.86	3.91	3.92	3.96	3.97	4.01	4.04	4.08	4.03	4.13	4.18	
3-Month Treasury Bill Rate <sup>c,u</sup>	3.62	3.57	3.68	3.65	3.90	3.99	4.46	4.90	5.18	5.48	5.74	6.18	6.50	6.53	
Cheques Cashied in Clearing Centres <sup>1</sup>	8,470	8,936	8,449	8,768	9,259	9,108	10,183	9,700	9,703	9,745	10,669	10,375	10,273		
Retail Trade	1,098	1,128	1,115	1,107	1,152	1,196	1,185	1,274	1,161.4	1,185.1	1,232.6	1,222.2	1,233.2		
Labour Force	3,408	3,408	3,416	3,441	3,460	3,491	3,473	3,504	3,485	3,532	3,471	3,515	3,493	3,555	
Employed	3,227	3,227	3,243	3,269	3,315	3,349	3,336	3,365	3,353	3,404	3,344	3,371	3,328	3,389	
Unemployed	181	181	173	172	145	142	137	139	132	128	127	144	165	166	
Unemployed as % of Labour Force	5.3	5.3	5.1	5.0	4.2	4.1	3.9	4.0	3.8	3.6	3.7	4.1	4.7	4.7	
Wages and Salaries	1,948	1,971	1,993	2,016	2,044	2,067	2,088	2,105	2,111	2,125	2,126	2,139			
Index of Industrial Employment	134.2	136.1	135.5	134.9	136.9	138.1	139.0	140.0	140.6	141.5	142.8	139.4	142.1	143.8	
Index of Industrial Production <sup>c</sup>															
Total Manufacturing <sup>c</sup>	195.4	200.4	202.7	203.9	205.0	212.2	212.3	212.7	212.5	215.2	214.9	208.7	211.5	215.4	
Non-Durables <sup>c</sup>	191.9	194.3	197.0	199.2	200.8	210.3	210.2	209.0	209.1	211.6	211.6	203.9	207.1	210.7	
Durables <sup>c</sup>	171.4	172.7	173.7	175.5	176.2	181.4	179.9	182.0	183.0	184.9	184.6	176.5	178.0	180.8	
Mining <sup>c</sup>	217.9	221.5	226.5	229.2	231.9	246.7	248.5	243.2	242.0	245.6	245.8	238.7	243.9	243.5	
Electric Power and Gas Utilities <sup>c</sup>	192.8	210.9	212.8	207.2	209.8	203.7	207.8	215.4	212.9	212.4	206.0	205.3	209.5	218.6	
Primary Energy Demand (Annual Rate)	229.2	236.4	236.5	239.0	233.9	242.6	238.1	240.9	241.2	250.6	256.9	254.4	252.6	251.3	
Exports (including re-exports) <sup>c</sup>	74.64	76.15	76.56	75.43	74.96	77.83	74.93	75.97	78.52	79.05	79.79	81.60	79.85	79.23	
Imports <sup>c</sup>	1,603	1,842	1,890	1,834	1,918	1,968	2,001	2,047	2,073	2,047	2,108	1,898	1,985	2,144	
	1,554	1,655	1,662	1,686	1,759	1,871	1,898	1,750	1,933	1,877	1,949	1,915	1,928	2,102	
Unclassified Indicators															
Foreign Exchange Reserves <sup>c,u</sup>	5,370	5,372	5,191	5,189	5,116	5,203	5,128	5,061	5,013	5,011	4,939	4,743	4,690	4,848	
Industrial Materials Price Index <sup>c,u</sup>	303.2	317.4	319.4	324.4	336.7	347.5	353.7	353.2	359.5						
Consumer Price Index <sup>c,u</sup>	141.8	142.0	142.3	143.3	144.5	145.3	145.7	147.3	148.4	149.7	151.0	153.0	153.9	154.3	
Toronto <sup>u</sup>	136.6	136.2	136.6	137.7	139.4	139.7	140.1	141.3	142.5	143.6	144.6	146.2	146.8	147.0	
Ottawa <sup>u</sup>	137.9	137.6	138.2	139.1	140.2	140.9	141.2	142.5	144.0	145.3	146.7	148.9	149.5	150.5	
Thunder Bay <sup>u</sup>	108.9	108.5	109.1	109.5	110.9	111.2	111.1	112.2	113.2	114.2	115.5	117.6	119.2	117.9	
Purchasing Power of 1961 Consumer Dollar <sup>c,u</sup>	0.71	0.70	0.70	0.70	0.69	0.69	0.69	0.68	0.67	0.67	0.66	0.65	0.65	0.65	

<sup>c</sup>Statistics for Canada.<sup>u</sup>Not seasonally adjusted.<sup>1</sup>Ontario less Toronto.

















BINDING SECT. OCT 24 1974



